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WEED ABSTRACTS

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NOTES FOR READERS

Weed Abstracts endeavours to provide a comprehensive coverage of the world's literature on weeds, weed control and closely allied subjects. To this end, over 370 journals and nearly 100 annual reports are regularly searched. Other journals, reports, bulletins, etc. are abstracted as they are seen. Additional coverage is obtained through agreements with other abstracting organizations.

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As far as possible the journal abbreviations used are those given in the World List of Scientific Periodicals. Holding library symbols are also taken from the World List, e.g. O.BO = Botany Department, Oxford. Numbers at the end of abstracts, e.g. 75(492) are for internal use only.

When a paper is by more than one author, the address of the first author only is given.

Where an abstract is taken from an abstracting journal the acknowledgement follows the abstract, e.g. Herb. Abstr. 2:163. Where it is quoted only in part the acknowledgement is preceded by the word "from", e.g. From Biol. Abstr. 2:294.

The Information Section is always pleased to receive comments and suggestions for the improvement of Weed Abstracts.

* An asterisk before the author's name indicates that only the title of the paper has been seen.

Continued from the inside back cover

ac	- acre(s)	in.	- inch(es)	p.s.i.	- pounds per square in.
a.e.	- acid equivalent	kg	- kilogram(s)	v/v	- volume/volume
a.i.	- active ingredient	l	- litre(s)	w/v	- weight/volume
cm	- centimetre(s)	lb	- pound(s)	w/w	- weight/weight
d.b.h.	- diameter at breast height	m	- metre(s)	>	- greater than
ft	- foot (feet)	ml	- millilitre(s)	<	- less than
g	- gram(s)	oz	- ounce(s)	#	- pounds per acre
gal	- gallon(s)	post-em.	- post-emergence	±	- with or without
ha	- hectare(s)	pre-em.	- pre-emergence		
		p.p.m.	- parts per million		

Language abbreviations: an initial capital denotes the language of the article, a small letter that of the summary:- Dan. - Danish, Du. - Dutch, E. - English, F. - French, G. - German, It. - Italian, Jap. - Japanese, Nor. - Norwegian, Russ. - Russian, Span. - Spanish, Sw. - Swedish.

See also 1741, 1742

1610. SPRINGENSGUTH, W. (PflSchAmt. der Landw.Kammer Westfalen-Lippe, Münster, Germany). Zur Bekämpfung von grasartigen Unkräutern. [For the control of grass weeds.] [Pap.read at] 4. Dtsche Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung, Hohenheim, 1961, pp.8.

A review is given of the control of grass weeds (mainly Alopecurus myosuroides) in rape, clover, lucerne, beet and cereals. The following recommendations are included: (a) TCA-sodium 20 kg/ha in 600-800 l water applied pre-sowing between late autumn and March gives excellent control of A. myosuroides in rape; (b) chlorpropham (50% a.i.) at 3-4 l/ha in 600 l water applied to clover and lucerne leys in winter to frost-free soil gives good control of A. myosuroides and Poa annua, without impairing the quality or delaying maturity of the hay crop; (c) harrowing pre-sowing and post-em. and calcium cyanamide applied pre-sowing helps to control grass weeds in beet; (d) good control of A. myosuroides in winter wheat is given by calcium cyanamide 2-2.5 dz/ha applied pre-em., followed by simazine post-em. 1.25-1.5 kg/ha in 800-1000 l water at the 4- to 6-leaf stage. Simazine at > 1.75 kg/ha caused crop damage and decreases in yield. - J.L.M. [O.W.]

1611. FLETCHALL, O.H., PETERS, E.J., HICKS, R.D., DAVIS, F.S. and TALBERT, R.E. Recommendations for weed control in field crops, 1961. Bull.Missouri agric.Exp.Sta., 1961, 762, pp.7, figs.2.

Recommendations are given for chemical weed control in maize, sorghums, small grains, soybeans, cotton, legumes, pastures and for control of brush, poison ivy (Rhus radicans), wild onion and garlic (Allium spp.). - M.G.G. [23(77.8)]

1612. WELLHAUSEN, H.W. Guide for using chemicals in weed control. Misc.Publ. Arkansas agric.Coll., [n.d.], 44, pp.8, (rev.).

Includes recommendations for the use of fenoprop, CDAA, simazine and naptalam and for the control of weeds in different crops and of aquatic weeds. See Weed Abstr. 7:1818q. - M.G.G. [34(76.7)]

1613. STAUFFER CHEMICAL COMPANY. (Stauffer Chemical Co., 380 Madison Ave., New York 17, U.S.A.). Eptam 6-E. Leafl. Stauffer Chem.Co., [n.d.], pp.2, figs.2.

Recommendations are given for the use of Eptam 6-E (emulsifiable liquid formulation of EPTC containing 6 lb EPTC/gal) for the control of annual grass weeds, deadnettle (Lamium purpureum), henbit (Lamium amplexicaule), Chenopodium album, Amaranthus retroflexus, Portulaca oleracea, nightshade (Solanum spp.), Sorghum halepense seedlings, Cyperus esculentus and C. rotundus (after existing stands have been ploughed and cultivated) in the following crops: lucerne, birds-foot trefoil and lespedeza 3 # pre-planting, safflower (Carthamus tinctorius), flax, varieties of snap and dry beans pre-planting at 3 #, snap and dry beans as lay-by application at 3 #, Irish potatoes at 3 # pre-planting except in eastern States of the USA, where Digitaria spp. require 4 #, Irish potatoes at 3-4 # as lay-by application within 4 weeks of crop emergence, (not suitable for the control of Digitaria in western States of the USA). Methods of soil preparation, overall and band application and incorporation are given. - M.G.G. [O.W.]

1614. STAUFFER CHEMICAL COMPANY. (Stauffer Chemical Co., 380 Madison Ave., New York 17, U.S.A.). Eptam 6-E (Northeastern USA). Leafl. Stauffer Chemical Co., [n.d.], pp.2, figs.2.

Eptam 6-E is recommended for the control of: annual grasses, Cyperus esculentus and C. rotundus (after the existing stands have been ploughed and cultivated) in Irish potatoes at 6 # a.i. applied pre-planting or immediately after drag-off and incorporated to a depth of 4-6 in., annual grasses in Irish potatoes at 3 # pre-planting or 4 # as a lay-by application within 4 weeks of the emergence of the crop, incorporated to a depth of 1-2 in., annual grasses in lucerne, birds-foot trefoil, lespedeza and varieties of dry bean at 3 # applied pre-planting and incorporated 1-2 in. deep, annual grasses in snap beans at 3 # incorporated 1-2 in. deep, as pre-planting or lay-by treatments, non-cropped areas at 6-12 # applied to weed-free soil and incorporated 4-6 in. deep. Notes on equipment and methods for incorporating EPTC are given. - M.G.G. [O.W.]

1615. STAUFFER CHEMICAL COMPANY. (Stauffer Chemical Co., 380 Madison Ave., New York 17, U.S.A.). Eptam 6-E (Western). Leafl. Stauffer Chem.Co., [n.d.], pp.2, figs.2.

Eptam 6-E is recommended for the control of annual grass weeds, deadnettle (Lamium purpureum), henbit (Lamium amplexicaule), Chenopodium album, Amaranthus retroflexus, Portulaca oleracea, nightshade (Solanum spp.), Sorghum halepense seedlings, Cyperus esculentus and C. rotundus (after existing stands have been ploughed and cultivated) in the western States of the USA in the following crops at

3 # pre-planting and incorporated to a depth of 3-4 in. :- lucerne, birds-foot trefoil, lespedeza, varieties of dry and snap beans, flax, Irish potatoes, safflower (Cartharus tinctorius), maize and sweet corn in the Yakima, Willamette and Boise Valleys, and on non-cropped ground. Quackgrass (Agropyron repens) is controlled in the Pacific Northwest in all the above crops except maize by 4 #, and in maize by 3 #. Methods of soil incorporation and sowing are given. - M.G.G. [O.W.]

1616. STAUFFER CHEMICAL COMPANY. (Stauffer Chemical Co.,380 Madison Ave.,New York 17, U.S.A.). Eptam 6-E (Southern States). Leafl.Stauffer Chem.Co., [n.d.], pp.2,figs.2.
Eptam 6-E is recommended for the control of all annual grass weeds and Sorghum halepense seedlings in the southern States of the USA in the following crops at the rates given: lucerne, birds-foot trefoil, lespedeza, varieties of dry and snap bean and Irish potatoes at 0.5 gal/ac [3 # a.i.] applied pre-em.; snap beans as a lay-by application and Irish potatoes post-em., within 4 weeks of emergence of crop at 0.5 gal/ac [3 # a.i.]; for annual grass weeds in sweet potatoes [Ipomoea batatas] 1.25 gal/ac [7.5 # a.i.] applied within 2 days of planting to a dry soil and not incorporated; on non-cropped areas at 1 gal/ac [6 # a.i.] to weed-free soil. EPTC 6 # a.i. applied pre-planting or between rows within 4 weeks of emergence of crops will control Digitaria spp. in Irish potatoes after the existing stands have been ploughed and cultivated. M.G.G. [O.W.]

1617. SEIFFERT, M. (Inst.Ackerbau,Univ. Rostock,Germany). Bodenbearbeitung, Bestandespflege und mechanische Unkrautbekämpfung nach einem nassen Herbst. [Cultivation, crop husbandry and mechanical weed control after a wet autumn.] Dtsch. Landw.Berl., 1961, 12,(3),139-141, tabs.1, bibl.4.
Includes recommendations for the use of harrows in cereal crops pre-em., and at 1-leaf and 3- to 4-leaf stages, as an alternative to chemical weed control, and for the use of calcium cyanamide at 150 kg/ha applied to winter-sown cereals at 3- to 4-leaf stage to control Apera spica-venti, prevalent during the wet autumn of 1960 in East Germany. Data are given of the percentages of weeds in cereals removed, disturbed and untouched by harrowing at the cotyledon, small-rosette and large-rosette stages. J.L.M. [O.W.]

1618. RADEMACHER, B. (Inst.für PflSch. der Landw.Hochschule,Stuttgart-Hohenheim, W.Germany). Beginn der Konkurrenz zwischen Getreide und Unkraut. [Onset of competition between cereal and weed.] [Pap.read at] 4. Dtsch.Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung,Hohenheim, 1961, pp.8, tabs.2,bibl.5.
In trials in 1957-60 to study the intera action between oats and Sinapis arvensis, 20 and 25 plants of each species, respectively, were grown in pots. Compared with weed-free control plots, losses in oat yields as a result of competition from S. arvensis plants according to degree of soil fertility and on a dry-matter basis were as follows: (a) at onset of tillering, 10.2-11.4%, (b) at onset of straw formation 21.2-25.8% and (c) at harvest 31.9-40.2%. In further trials conducted under similar conditions, S. arvensis plants were removed from the oat stands at (a) the onset of tillering and (b) at onset of straw formation. The resultant reductions in grain yield at harvest were for (a) 15.2-25.4% and for (b) 28.9-46.8%. Removal of S. arvensis plants at more advanced stages of oat growth did not further reduce the yield at harvest. These yield reductions could not be offset by increasing the amount of fertilizer applied and the results indicated the relative importance of weed infestations at an early stage of crop growth in reducing subsequent yields. J.L.M. [O.W.]

1619. NEURURER, H. (Bundesanst.für PflSch.,Vienna,Austria). Unkräuter, die den Mähdrusch stören. [Weeds which hinder combine harvesting.] Pflanzenarzt, 1961, 14,(7),61-63, figs.7.
Gives descriptions, methods of control and illustrations of the following weeds which cause difficulties during combine harvesting operations in Austria, by becoming entangled in the cutter bar, threshing drum, and clearing and conveying mechanisms, in addition to raising the moisture content of the harvested grain: Galium aparine, Vicia sp., Polygonum convolvulus, Convolvulus arvensis, Veronica sp., Galeopsis ladanum, Stellaria media, Centaurea cyanus and Cirsium spp. - J.L.M. [60(436)]

1620. NEURURER, H. (Bundesanst.für PflSch,Vienna,Austria). Wo liegen noch Ertragsreserven? [Where is the rest of the yield?] Pflanzenarzt, 1961, 13,(11),110-12, tabs.4,bibl.7.
The economics of weed control in Austria, with particular reference to the use of

2,4-D, MCPA and DNOC, are briefly reviewed. A table gives the estimated loss in yield per ha from weed competition in 1958 in wheat, rye, barley, oats, potatoes, sugar beet and grassland. - J.L.M. [64(436)]

1621. BAYER, D. (Univ.California,Davis, U.S.A.). Weed control in cereals. Proc. 13th Annu.California Weed Conf., 1961, 56-8.

The uses of 2,4-D in wheat, barley and oats, and of 2,4-D and MCPA in rice, milo, grain sorghum and maize are briefly reviewed. The following herbicides have shown promise: (a) EPTC applied to rice at 2 # pre-sowing on dry soil prior to flooding. The margin of safety is narrow and the results erratic; (b) 2,3-dichloropropionanilide 4 # applied to rice 2 to 4 weeks after the rice has emerged, especially for the control of Echinochloa crusgalli. The water level should be lowered to expose the weeds before application and restored to its original level immediately after; (c) propazine and atrazine applied at 2-4 # to milo, grain sorghum and maize to control annual weeds, under careful irrigation management. Problems of soil residues have arisen and these herbicides cannot be recommended for general use. - M.G.G. [O.W.]

1622. MAY, J.R. (Summarizer). Cereal crops. (5 reports). Res.Rep.E.Sect.Nat. Weed Cttee Canada, 1960, 1-4.

Peas. Neither simazine 2.5 # applied pre-em. after ploughing in the spring nor any of the following applied in the autumn caused any significant reduction in weeds (mainly Agropyron repens and Equisetum arvense) but neither did they reduce pea yield: Karmex liquid [diuron] 2 and 3 #, dalapon 4 and 7 #, dalapon 7 # + 2,4-D (butyl ester) 1 #, amitrole 6 # ± prior ploughing and discing and 8 #, TCA 25 # + 2,4-D (butyl ester) 1 # after ploughing and discing.

Oats and wheat. Yield of Rodney oats was not significantly affected by treatments at the 5-leaf stage with 2,4-DB (ester) 1 and 1.5 #, fenoprop (ester) 0.5 and 1 #, mecoprop 1.5 #, CP 1815 (MCPA + 2,3,6-TBA) 0.5 #, or 2,3,6-TBA 4 # + 2,4-D 8 #. No damage was observed on oats or wheat treated at the 5-leaf stage with mecoprop (potassium) 1.8 and 2.25 #, MCPA (sodium) 0.5 and 1 #, MCPB (sodium) 1 and 1.5 #, and 2,4-DB (butyl ester) 1 and 1.5 #. Weed control with the higher rates of mecoprop, MCPB and 2,4-DB was somewhat better than with MCPA 1 #.

Flax. In trials with MCPB and MCPA + MCPB 1:15 mixture, each at 1 and 1.5 #, applied at stages from 3 in. high to 7-10 in. high, the higher rate of both treatments caused slight injury to Marine flax at all stages; the crop recovered well, though maturation was slightly delayed. The mixture gave excellent control of Brassica kaber var. pinnatifida at both rates and was significantly better than MCPB alone. Both treatments gave good control of Chenopodium album and Amaranthus retroflexus; at the higher rate they gave moderate to good control of Cirsium arvense and Sonchus arvensis, but only checked Polygonum spp., P. convolvulus and Equisetum arvense.

Spergula arvensis. MCPA gave better control when sprayed at the seedling stage than at flowering. When sprayed at the seedling stage, MCPA 0.5 #, mecoprop 0.75 and 1.5 #, CP 1815 0.5 and 0.75 #, and Reglone (diquat dibromide) 0.5 and 1 # all gave significant control, but without significant differences between treatments; stands of timothy and clovers sown on the plots were heavily reduced by CP 1815 0.75 # and diquat dibromide 0.5 and 1 #. - D.M.L.S. [O.W.]

1623. AMANN, M. (Inst.für Pflanzensch. Landw.Hochschule,Stuttgart-Hohenheim,Germany). Bekämpfung von Ackerfuchsschwanz (Alopecurus myosuroides) in Winter-Getreide mit Triazinen. [Control of black grass (Alopecurus myosuroides) in winter-sown cereals with triazines.] [Pap. read at] 4. Dtsche Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung, Hohenheim, 1961, pp.7, tabs.5,bibl.5.

In 18 trials in 1959-60, simazine at >1 kg/ha and atrazine 1 kg/ha applied post-em. in mid-March to winter wheat at the 3- to 6-leaf stage gave moderate and excellent control, respectively, of Alopecurus myosuroides treated at the 3- to 5-leaf stage. Simazine at 1 kg/ha gave 86 and 46% control of A. myosuroides where the rainfall during 14 days after application had been 25 and 8.5 mm, respectively. In further trials, both simazine and atrazine at 1 kg/ha post-em. gave 82.7 and 95% control, respectively, of A. myosuroides at the 2- to 3-leaf stage in winter wheat, where the rainfall during 14 days after application had been 24 mm. Simazine at >1 kg/ha and atrazine at 1 kg/ha damaged winter wheat and resulted in lower yields than controls. Simazine at 1.2 kg/ha caused lower yields of spring barley. In 1 trial simazine and atrazine [at rates unspecified] caused no damage to winter rye. From these results it was recommended that rates of simazine applied post-em. to cereals should not exceed 1 kg/ha. - J.L.M. [O.W.]

1624. WORLD CROPS. Menace of wild oats. World Crops, 1961, 13,(10),409, figs.2.

Includes the information that in Gt Britain more than 1 million acres of cereal crops are affected by wild oat infestation each year. Infestations are regarded as heavy in Canada, USA, Australia, the Netherlands, Sweden, France and Germany, moderately heavy in Denmark, Belgium, Morocco and Spain and light in Norway, Finland, Greece and Cyprus. Infestation is also believed to be heavy in Russia. - P.J.B. [O.W.]

1625. HÄFLIGER, E. (J.R.Geigy,A.G.,Basel, Switzerland). Beiträge zur chemischen Flughaferbekämpfung. [Contributions to the chemical control of wild oats.] [Pap.read at] 4.Dtsche Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung,Hohenheim, 1961, pp.5, figs.2,tabs.1.

A review is given on the control of Avena fatua in wheat, barley and rye with barban and G34361 (2-chloro-4-allylamino-6-isopropylamino-s-triazine). Barban 3 l/ha [% a.i. not stated] in 100-250 l water applied post-em., has given good control of A. fatua when applied at the 1- to 2.5-leaf stage in wheat, rye and most varieties of barley. Graphs are given showing (a) the effect of different doses of barban on the control of A. fatua in spring wheat and spring barley, and (b) the inhibitory effect of different densities of barley stands on A. fatua. [See Weed Abstr.10;7.

G34361 (50% a.i.), water solubility 51 p.p.m., is taken up by both roots and leaves of grasses and broad-leaf weeds. Rates between 1 and 4 kg/ha, according to soil-type and moisture content and weather conditions on and after the date of application, applied either pre-em. or post-em., have given satisfactory weed control in cereals. - J.L.M. [O.W.]

1626. BACHTHALER, G. (Höhere Landbauschule, Rotthalmünster,Bavaria,Germany). Erfahrungen in den chemischen Wildhaferbekämpfungsversuchen zu Sommergerste und Rüben. [Experiences in trials on the chemical control of wild oats in spring sown barley and beet.] [Pap. read at] 4. Dtsche Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung, Hohenheim, 1961, pp.4.

In trials in 1957-9 on the control of Avena fatua in oats, CDAA and CDEC (both 50% a.i.) each at 15 l/ha in 600 l water were applied 10 days before sowing. On 8 treated plots, decreases in the numbers of emerged barley plants ranged from 8-33% and 6 treated plots showed an increase of 13.5-78% in barley plant numbers, compared with control plots. In most trials CDEC gave better control of A. fatua than CDAA. The effectiveness of both CDEC and CDAA against A. fatua was not influenced by soil type or variations in rainfall encountered during the trials, but the dry March of 1959 delayed their action on A. fatua and in addition some crop damage occurred. In 2 trials in 1959, 1,2,4,5-tetrachlorobenzene (50% a.i.) at 50 kg/ha applied 10 days before sowing, gave ineffective control (<43%) of A. fatua and decreased the stand of spring barley by more than 40%, compared with controls. In trials in 1960, barban (12.5% a.i.) at 2 and 4 l/ha in (a) 300 l water and (b) 600 l water, was applied post-em. (weed and crop) to spring-sown barley, varieties Donaria and Isaria. Applied when A. fatua was at the 1-leaf stage, barban at 2 and 4 l/ha, both in 300 l water, gave 0 and 40% kill of A. fatua, respectively. Applied when A. fatua was at the 4- to 6-leaf stage, barban at 2 and 4 l/ha, both in 600 l water, gave 42-74% and 72% control of A. fatua, respectively. At these rates barban caused no crop injury.

In 16 trials in 1958-60 on the control of A. fatua in beet, TCA (sodium) + chloralchloracetamide 15-20 kg/ha in 600 l spray applied 3-6 days before sowing gave 82-99% control of A. fatua. TCA + chloralchloracetamide applied at the higher rates caused a 5-10% reduction in yield of beet, compared to controls. At the lower rates of application this effect was nullified and in some cases there was slight increase in yield. Dichlorobutyric acid (65% sodium salt) at 15-20 kg/ha applied 3-6 days before sowing, gave 82-100% control of A. fatua; the yield of beets was reduced by 12%. Dichlorobutyric acid 10 kg/ha applied directly after sowing gave almost complete control of A. fatua and caused no crop yield reduction. Chlorpropham (50% a.i.) at 8 kg/ha applied 3-6 days before sowing gave 72-98% control of A. fatua; the variability in control was due to variations in soil moisture. Chlorpropham at 10-12 kg/ha was no better than at 8 kg against A. fatua. At these rates, chlorpropham did not affect the yield of beets. 1,2,4,5-tetrachlorobenzene (50% a.i.) 20-50 kg/ha applied pre-em. or post-em. in both cases gave unsatisfactory control of A. fatua and caused considerable decreases in the beet yields. Barban (12% a.i.) at 10 kg/ha applied to beets at the 4-leaf stage gave only 50% control of A. fatua; yield of beets was unaffected.

The following broad-leaf weeds in beet crops were controlled by dichlorbutyric acid and chlorpropham: Veronica spp., Galium aparine, Stellaria media, Sinapis arvensis and Polygonum convolvulus. J.L.M. [O.W.]

1627. SELLECK, G.W. (Monsanto Chem. Co.,St.Louis,Missouri,U.S.A.). A summary of work in Canada and United States with Avadex. Proc.14th Meet.W.Sect.Nat.Weed Cttee,Canada, 1960, 6-8.
Di-allate has given control of wild oats [Avena spp.] when applied early in the season before the weed seeds germinated, when wind velocities were below 15 m.p.h., on a smooth soil surface of good tilth and incorporated immediately to a depth of 1-2 in. Wild oats germinating late in the season were controlled by very shallow incorporation in spring. Spray volumes had little effect on the results over the range 4-10 gal/ac for water, or 1-4 gal/ac for diesel oil, nor did air temperatures in the range 33-65°F with soil temperatures in the range 36-65°F, or spray pressures of 12-60 p.s.i. Air applications were slightly less effective than ground applications; wet soils or heavy textured soils with high organic contents decreased the efficiency and the rate of evaporation of di-allate; temperatures above 70°F at the time of application substantially increased loss from the soil surface. Spring applications in Canada were twice as effective as autumn applications. Crops not injured by rates of 2 # included sugar beet, rapeseed, peas, legumes (red, alsike, sweet and ladino clovers and lucerne), potatoes, soybeans, carrots, maize and sunflower; barley, blue grass [Poa pratensis] , brome grass [Bromus inermis], crested wheat grass [Agropyron sp.] and rye grass [Lolium sp.] tolerated 1.5 #, durum wheat 1.25 # and spring wheat 1 #. Selectivity of wheat and barley was increased by (a) delaying sowing for a few days after spraying, (b) spraying after sowing, (c) sowing seed, after spraying and incorporation, at depths below those of the treated soil. At 2 #, residual effects were observed the following year on wild and domestic oats. In the Western USA di-allate 1.5 # has controlled many broad-leaved weeds including Chenopodium album. - M.G.G. [O.W.]

1628. RADEMACHER, B. (Inst.für PflSch. der Landw.Hochschule,Stuttgart-Hohenheim, W.Germany). Niederhaltung des Huflattichs im stehenden Getreide. [Suppression of coltsfoot in standing cereals.] [Pap. read at] 4. Dtsch.Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung, Hohenheim, 1961, pp.5, tabs.1,bibl.2.
In trials in 1959, mecoprop 2.3 and 2.9 l/ha in 800 l water, applied post-em. (weed and crop) to winter wheat on completion of tillering, gave moderate control of Tussilago farfara and a 17% increase in yield of wheat, compared with control plots. Similar applications of mecoprop applied late May of the following year to spring-sown oats, gave 5-7% control of remaining stands of T. farfara and a 74% increase in yield of oats, compared with control plots, which at this stage had a 90-100% cover of T. farfara with leaves 50 cm high and 25 cm broad. The residual effect of the previous years' treatment, with no further treatments, gave a 48% increase in yield of oats. [See also Weed Abstr.10:541.] - J.L.M. [O.W.]

1629. TINGEY, D.C. Control of Roemaria poppy in winter wheat. Bull.Utah agric.Exp. Sta., 1961, 429, pp.9, figs.2,tabs.4,bibl.17.
Roemeria refracta is an early-maturing annual or winter annual weed in certain localized dryland areas used primarily for winter wheat production and to a lesser extent for lucerne hay production in Utah. The results of 2 years' trials in which 2,4-D amine and ester, 2,4,5-T isopropyl ester and mixtures containing 75% 2,4-D ethyl ester + 25% 2,4,5-T were used, indicated that a relatively high rate (2.67 #) of 2,4-D ester applied at or before the flowering stage of R. refracta was required to prevent it producing seed. It was considered that the main problem with this weed was to prevent it producing seed during fallow. - P.J.B. [18(79.2)]

1630. JONES, G.E. (Summarizer). Maize (12 reports). Res.Rep.E.Sect.Nat.Weed Cttee, Canada, 1960, 9-16.
Atrazine and simazine at 1.5-2 # pre-em. continued to give consistently good results; 1 # was insufficient. Atrazine applied post-em. (maize 2-4 in. tall) gave results similar to pre-em. treatment. Pre-em. trials with several granular formulations of 2,4-D indicated fair to good early weed control with cultivation needed to control later germinating weeds; no reports of damage were received, but in 1 trial a special rapid-dissolving formulation applied at 3 and 4 # reduced the rate of maize growth. One experiment in which cultivations were given when maize was 3 in. tall and when 3 in and 12 in. tall, following pre-em. simazine treatment, indicated that the cultivations had no beneficial effect where weeds were well controlled.
Good results were obtained with CDAA 3 # + 2,3,6-trichlorobenzene 0.5 and 1 # and with CDAA-T (CDAA + trichlorobenzylchloride) 3 and 4 #. Benzabor [Disodium tetraborate pentahydrate 54.5%, disodium tetraborate decahydrate 35.5%, and trichlorobenzoic acid] 6.25 and 12.5 # caused severe maize injury. Zytron (O-(2,4-dichlorophenyl)-O-methylisopropyl-

phosphoroamidothioate) 10 and 15 # pre-em. caused no ill effects and gave fairly good weed control. Other herbicides tested were atrazine granular, 2,4-DB, MCPB, amitrole, diuron, TCA and CDEC. - D.M.L.S. [O.W.]

1631. GRANCINI, P. (Stazione di Maiscoltura, Bergamo, Italy). Mais: erbe infestanti e diserbo. [Maize: weeds and weed control.] Agricoltura, 1961, 10,(3),61-8, (illus.).
A general discussion of the problem in Italy in which some account is given of the principal weeds, results with atrazine and simazine, and the effects of irrigation, rolling, hoeing and handweeding on herbicidal action.
D.M.L.S. [G.R.I.]

1632. MEIER, G. (Hettstedt, Halle, E.Germany). Das Bandspritzen, ein wirtschaftliches Verfahren bei der Unkrautbekämpfung mit W6658. [Band-spraying, an economic method of weed control with W6658.] Wiss-Tech.Fortschr. Landw., 1961, (2),66-7.
In trials in 1958-59 in East Germany, maize grown for silage and sown at a rate of 42 kg/ha, yielded (a) 600, (b) 385, and (c) 180.6 dt/ha, where weed control measures were (a) W6658 [simazine] 1.6 kg/ha in 300 l water band-sprayed, with 3 post-em. inter-row hoeings, (b) 3 post-em. inter-row hoeings, and (c) untreated. Comparative costs are given for the different weed control measures in relation to the estimated value of the harvested crop. - J.L.M. [292(43)]

1633. HUBERT, K. (Biol.Zent.Anstalt, Berlin, Germany). Neue Möglichkeiten bei der chemischen Unkrautbekämpfung im Mais nutzen. [New possibilities of using chemicals for weed control in maize.] Wiss-Tech.Fortschr. Landw., 1961, (2),63-6, figs.2, tabs.2.
The following weed control measures in maize are briefly reviewed: W6658 [simazine] 4 kg/ha in 600 l water applied pre-em. to prevent the germination of weed seeds, 2,4-D 1-1.5 kg/ha in 400-600 l water applied post-em. to control Cirsium arvense and Chenopodium album, and DNOC (ammonium) 4-6 kg/ha in 600 l water applied post-em. for the control of, inter alia, Galeopsis ladanum, Veronica sp., Galium aparine, Polygonum sp., Lamium sp. and Stellaria media. The advantages of band spraying are briefly discussed. - J.L.M. [292(43)]

1634. HUBERT, K. (Biol.Zent.Anstalt, Berlin, Germany). Technische Probleme bei der Schädlings-und Unkrautbekämpfung im Mais. [Technical problems with pest and weed control in maize.] Dtsch.Agrartechnik, 1960, 10,(3), pp.1-10, figs.6, bibl.23.
Recommendations, made on the basis of work in East Germany, are given for weed control in maize with MCPA, 2,4-D, DNOC (ammonium) and W6658 [simazine]. Excellent weed control has been obtained with W6658 applied pre-em. Winter-sown cereals, vetches or potatoes, but not clover, can follow maize treated with W6658. Overdoses of all the cited herbicides applied post-em. retarded growth of young maize plants, frequently causing leaf-roll. DNOC 4-6 kg/ha in 600 l solution applied to maize 5-15 cm high when weeds were at the rosette stage gave good control of Veronica spp., Galeopsis ladanum, Galium aparine, Polygonum spp. and Stellaria media. 2,4-D 1-1.5 kg/ha in 400-600 l solution or 25-30 kg dust/ha both applied pre-em. to maize, controlled Cirsium sp., Chenopodium album and Lepidium draba. - J.L.M. [311(43)]

1635. NEURURER, H. (Bundesanst.für PflSch., Vienna, Austria). Nachwirkung der vorjährigen Simazin-und Gesaprimspritzung zu Mais. [The residual effect of the previous years' simazine and Gesaprim spraying on maize.] Pflanzenarzt, 1961, 14,(8),76-7, figs.1.
The degree of injury to winter- and spring-sown maize in trials in Austria after pre-sowing spring applications of simazine and atrazine at 4 and 3 kg/ha applied overall and at 1.4 and 1.2 kg/ha applied in bands, was contrasted. Dry weather in the autumn of 1959 and at the beginning of April 1960 increased the susceptibility of both winter- and spring-sown maize to simazine and atrazine residues, especially on heavy soils with low humus content, and caused severe yellowing of the leaves in young plants. A clear line of demarcation between the discoloured- and normal chlorophyll-containing sections of the epidermis of affected leaves was a characteristic of crop injury caused by triazine herbicides and differed from the relatively gradual change in colour along the length of the leaf, as shown on the leaves of plants injured by extremes of weather or by the attacks of insects or fungi. - J.L.M. [61(436)]

1636. ROBINSON, E.L. and DOWLER, C.C. (U.S.Dep.Agric., Whiteville, N.Carolina, U.S.A.). Herbicides for the control of witchweed (Striga asiatica) in early and late planted corn. Weeds, 1961, 9,(4), 522-6, figs.1, tabs.2, bibl.9.
In trials in 1958 and 1959 in an area infested with Striga asiatica, maize sown on 1 May nearly always gave higher yields than that sown on 1 April both on treated and control plots. Highest yields were

obtained where 2,3,6-TBA 1.5 # pre-em. followed by 4 post-em. treatments of 0.25 #, or 2.5 # pre-em. with 2 post-em. treatments at 0.25 # were applied. Good yields also resulted from the use of 2,4-D 4 # pre-em. + 2,3,6-TBA 0.25 # 4 times post-em., from 2,4-D 3 # pre-em. + 0.25 # 4 times post-em., and from 2,4-dichlorophenoxyacetamide (2,4-DA) 2 # pre-em. + 2,3,6-TBA 0.5 # twice post-em. Intervals between post-em. applications were fortnightly. Yields in general reflected the ratings for maize injury and Striga growth. Simazine, mixed monoethanolamine salts of polychlorobenzoic acids, or 2,4-DA alone at relatively low rates, did not increase yields, but post-em. applications of either 2,4-D or 2,3,6-TBA in most cases did. - D.M.L.S. [O.W.]

1637. MUCCI, F. Produzione e resistenza al-l'allettamento nel riso trattato con 2,4-D. [Yield and resistance to lodging of rice treated with 2,4-D.] Ann.Sta.sper. Risicolt.,Vercelli 1956, 1960, 107-24, (It.f.e.),(illus.),bibl.23.
In field trials over 2 years in N. Italy, rates of 2,4-D exceeding 200 g/ha a.i. applied in more than one application, reduced rice yields, especially when a concentration of 0.1%, instead of 0.05%, was used. In all plots treated with 2,4-D, the average height of rice plants was reduced but their resistance to lodging was increased. From Field Crop Abstr.14:1165. J.W.F.

1638. SMITH, R.J., HINKLE, D.A. and WILLIAMS, F.J. Pre-harvest desiccation of rice with chemicals. Publ.Agric.Exp.Sta. Univ.Arkansas, 1959, 619.pp.16.
Five years' work at the Stuttgart Experimental Station showed that sodium chlorate 18.7 l/ha and magnesium chlorate 8.15 l/ha act as desiccants of rice grain with a moisture content of 21-31% and should be applied when the moisture content averages 24-26%. They reduce moisture content of the grain by about 1% per day and under the conditions of these experiments made harvesting possible within 6 days of treatment. The leaves are dried but the stalks only slightly. Yield is reduced, but germination losses from combine-harvesting, or bushel weight are not affected. When applied to varieties Rexark, Zenith and Bluebonnet 50, combine-harvesting is facilitated, but not when applied to Arkrose. Endothal and sodium monochloroacetate aid desiccation but reduce yield and affect quality. DEF [S,S,S-tributylphosphorotrithioate] is ineffective. From Agron.Trop.15,(6),697. D.M.L.S.

1639. * VEGA, M.R. and OBIEN, S.R. The response of some lowland rice varieties to 2.4-dichlorophenoxyacetic acid (2.4-D). Philipp.Agriculturist, 1960, 44,(1),45-65, (illus.),bibl.6.

1640. NORFOLK AGRICULTURAL STATION. (Norfolk Agric.Sta.,Sprowston,Norwich). 53rd Annu.Rep.,Norfolk Agric.Sta., 1961, pp.25, figs.1,tabs.2.
Includes a preliminary report on the use of pre-em. herbicides in sugar beet. A very shallow incorporation of endothal and propham appeared to eliminate the need for rainfall. The variable control of wild oats given by di-allate was thought to be due to the clay and organic content of soil and variations in the efficiency of incorporation of this herbicide. - M.G.G. [O.W.]

1641. WINNER, C. (Inst.Zuckerrübenforschung, Göttingen,Germany). Zur Rentabilität von Pflanzenschutzmassnahmen im Zuckerrübenbau unter besonderer Berücksichtingung der chemischen Unkrautbekämpfung. [The profitability of plant protection measures during sugar beet cultivation with special regard to chemical weed control.] Zucker, 1960, 13,(12),pp.6, tabs.1.
The economics of pest control measures in sugar beet are reviewed and costs of controlling fungi, insect pests and weeds contrasted. Eight factors affecting the profitability of controlling weeds in sugar beet are listed. They are: (a) degree of weed infestation, (b) weather and soil conditions, (c) initial crop plant populations, (d) mean costs of herbicide per ha, (e) singling date, (f) available labour per unit of area, (g) labour costs of singling, etc., and (h) crop yield. Ways of limiting costs of herbicidal use include: 1. limiting treatment only to areas with heavy weed infestations and to areas on which seed beds were prepared early, 2. band-spraying, 3. thinning crops on unsprayed areas with relatively heavy weed stands before crops on sprayed areas. - J.L.M. [301(43)]

1642. HÄRTEL, K. Lohnt der Einsatz von Herbiziden zur Verhütung der Frühverunkrautung im Kartoffelbau? [Does the use of herbicides for the prevention of early-season weed infestation in potato crops pay?] [Pap.read at] 4. Dtsche Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung, Hohenheim, 1961, pp.9, tabs.2,bibl.11.
Included in a review of cultural and chemical methods of weed control in potatoes are the results of 13 trials in 1960 in which Aretit

(dinitroalkylphenylacetic acid ester - rate not stated) applied post-em. to seed potatoes up to 10 cm high, gave good control, both at 5-7 days and at 4 weeks after application, of Chenopodium spp., Sinapis arvensis, Raphanus raphanistrum, Stellaria media and Galeopsis spp., and moderate control of Polygonum spp. - J.L.M. [O.W.]

1643. BURTCH, L.M. (Spreckels Sugar Co., 715W Fountain Way, Fresno, California, U.S.A.). Chemical weed control in sugar beets - current status. Proc.13th Annu.California Weed Conf., 1961, 54-6.

TCA, endothal and EPTC applied pre-sowing and incorporated mechanically or watered in gave control of weeds in sugar beet under experimental conditions. Difficulties of securing even mechanical incorporation, the formation of crusts caused by irrigation and unpredictable rainfall have limited the use of herbicides by commercial growers. Dalapon has been used post-em. when no mechanical method has been possible, but growth of sugar beet has been stunted. Promising results have been obtained with a formulation of endothal (TD66) with improved stability in soil and propyl ethyl-n-butylthiolcarbamate which has a greater margin of safety for sugar beet than EPTC. - M.G.G. [O.W.]

1644. COITEUX, J.S.F. (Summarizer) Turnips, mangels, and sugar beets. Res.Rep. E.Sect.Nat.Weed Cttee, Canada, 1960, 23-36.

Kale, Rape, and Turnips (2 reports). Amiben 2 # and Geigy 444E [2-chloro-4,6-bis (diethylamino)-s-triazine] 1.5 # pre-em. controlled Amaranthus retroflexus and Chenopodium album without injuring the 3 crops; at 2.2 # amiben controlled Echinochloa crusgalli but caused some injury to kale and turnips. Geigy 444E 4 # did not control E. crusgalli. Trysben [trichlorobenzoic acid (dimethylamine)] caused leaf curling, even at 0.4 #.

EPTC 4 # (incorporated) caused no reduction in stand or dry weight of any of the 3 crops when applied 1, 4, 8 or 12 days before sowing, but reduced dry matter yields when applied the same day as sowing.

Rutabagas (Swede turnips) (7 reports). The following caused severe stand reduction or injury when applied 3-4 weeks before sowing: amiben 4 and 6 #, EPTC 4 and 5 #, fenac 1.5 #, Karmex [diuron] 2 #, diuron granular 2 #, prometon 3 #, trietazine 3 # and monuron 1 #. The following caused no or negligible injury: dalapon 7 # applied 3 weeks before sowing, amitrole 6 # pre-sowing + 6 # post-em.; Vegadex (CDEC) 4 # applied 5, 11 and 18 days before sowing, chlorpropham 2 # and Reglone (diquat dibromide) 2 #, 1, 8 and 15 days pre-sowing, EPTC 4 # 5, 11 and 18 days pre-sowing and 9 # 0, 5 and 10 days pre-sowing. Injury or stand reduction was caused by simazine 1.5 # applied in spring, Karmex (diuron) 3-5 # applied in autumn, Randox (CDAA) 4 # applied 18 days pre-sowing (but not when applied 5 or 11 days pre-sowing), PCP 2 gal/ac (sic.) and 2,3,6-TBA 2 # applied 1, 8 and 15 days pre-sowing. 2,3,6-TBA 2 # incorporated gave 100% control of Chenopodium album and amitrole 6 # + MCPA ester 1 # gave about 95% control of C. album and Stellaria media.

Sugar beets (3 reports). Good results pre-em. were obtained with endothal 3 # + dalapon 4 # and with endothal + TCA, EPTC + dalapon and EPTC + endothal mixtures and pre-sowing with EPTC 3 # and Beetox [?] 1 gal/ac. Beetox 1.5 and 2 gal/ac caused some injury.

Red beets (1 report). In a trial with 34 different treatments the best yields were obtained with mixtures of endothal + dalapon or + TCA applied pre-em. FW734 (3,4-dichloropropionanilide) 4 #, applied 35 days after sowing, killed the beet. D.M.L.S. [O.W.]

1645. SCHULZ, H. Zur Unkrautbekämpfung in Hackfrüchten mit Kalkstickstoff. [On the control of weeds in sugar beet and potatoes with calcium cyanamide.] [Pap. read at] 4. Dtsche Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung, Hohenheim, 1961, pp.7, tabs.3.

The results are given of trials in 1960 to determine the effect of calcium cyanamide on early-sown beet. Rates of (a) 160 kg N/ha applied before seed-bed preparation, (b) 40 kg N/ha applied 3 days pre-sowing and (c) 40 kg N/ha applied pre-em., gave 84, 63 and 64% weed control, respectively, and 16, 6 and 6% reduction in beet plant stands, compared with control plots. In trials in 1959 in potatoes, calcium cyanamide at (a) 2 dz/ha (non-oiled) + 2 dz/ha (granulated) pre-em., (b) 3 dz/ha (non-oiled) pre-em. and (c) 2 dz/ha (granulated) post-em., with all plots harrowed pre-em. after treatment, gave 58, 66 and 7% weed control, respectively. - J.L.M. [O.W.]

1646. SCHMIDT, O. Zur Bekämpfung des Franzosenkrautes in Rüben und Kartoffeln mit Simazin. [On the control of gallant soldier in beet and potatoes with simazine.] [Pap.read at] 4. Dtsche Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung, Hohenheim, 1961, pp.3, tabs.2.

In 3 trials in 1958, simazine at (a) 0.25, (b) 0.05 and (c) 1.0 kg/ha was applied on 19 June, 1958, post-em. to potatoes, var. Benedikta grown in sandy soil, after the final ridging-up. The tuber yield and starch content of tubers of treated plants harvested on 12 September showed respective increases of 29 and 2.3% for (a), 28 and 0.8% for (b) and decreases of 12 and 12.9% for (c), compared with controls. In 4 trials in 1960, granular simazine at (a) 0.375 kg/ha and (b) 0.75 kg/ha was applied on 27 June, 1960, post-em. to potatoes, var. Eva, after the final ridging-up. The tuber yields of treated plants harvested on 3 September showed an increase of 2.5% for (a), and a decrease of 11.5% for (b). Spray treatments in general weremore effective than granular applications; in the latter case the herbicide tended to fall off the ridges. Simazine gave economic and effective late-season control of dense stands of Galinsoga parviflora in potatoes, but since it gave poor control of Chenopodium album, (usually found in association with G. parviflora), its use for late-season weed control in potatoes was limited. J.L.M. [O.W.]

1647. KRÜGER, H. Beitrag zur Queckenbekämpfung im Kartoffelbau mit Natriumtrichloracetat. [Contribution to couch grass control in potatoes with sodium trichloroacetic acid.] [Pap.read at] 4. Dtsche Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung, Hohenheim, 1961, pp.5, tabs.2, bibl.1.

The results are given of trials in which TCA sodium 20-40 kg/ha in 800 l water was applied to potatoes. TCA 20 and 30 kg/ha applied pre-em. (weed and crop) in mid April to potatoes, in loamy sand soilgave 77 and 96% control of Agropyron repens and 80 and 50% control, respectively, of Chenopodium album and Sinapis arvensis. Applied in mid April, TCA gave better weed control than when applied at the end of April. TCA at >20 kg/ha applied mid April and 20-40 kg/ha applied at the end of April caused leaf discoloration and inhibited the growth of tops and tubers. In trials to determine the effect of TCA on potato tubers, in sandy loam soil, TCA 20, 30 and 40 kg/ha was applied pre-em. on 15 May and 1 June, and post-em. on 11 and 23 June. At 14 days after application, the tops of potato plants were damaged after all treatments, except TCA 20 kg/ha applied pre-em. Decreases in (a) number of tubers per plant, (b) yield of tubers per plant and (c) average weight of tuber ranged from (a) 0-27%, (b) 10-36% and (c) 6-31%, according to the rate of application of TCA. TCA applied post-em. on 23 June affected tubers only slightly. Starch content of the tubers of treated plants was only slightly impaired.

In trials to compare the effects of TCA sodium, sodium trichlorpropionate and monochloracetate sodium all applied at 20 and 30 kg/ha post-em. to potatoes infested with dense stands of A. repens 25 cm high, monochloracetate sodium was ineffective against A. repens and caused crop damage. TCA sodium and trichlorpropionate sodium gave insufficient control of A. repens, though crop damage was only slight. - J.L.M. [O.W.]

1648. PÄTZOLD, C. (Inst.PflBau,Braunschweig-Völkenrode,Germany). Bekampfung von Spätunkräutern in Kartoffeln mit Wuchsstoffen. [Control of late germinating weeds in potatoes with growth-regulating herbicides.] [Pap. read at] 4. Dtsche Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung, Hohenheim, 1961, pp.5, tabs.3.

The results are given of trials in 1953-58 in which 2,4-D sodium, MCPA + 2,4,5-T ester and MCPA salt were applied post-em. to potatoes, varieties Bona and Olympia [see also Weed Abstr.11:46]. 2,4-D sodium 1, 2 and 3 l/ha [% a.i. not stated] applied post-em. at flowering caused 6-10% decreases in yield; when 2,4-D sodium was applied before the tops had discoloured, yields were generally unaffected. No significant changes in tuber size resulted from the treatments. Of the treatments used, only MCPA salt at 4 l/ha resulted in slightly higher tuber yields than untreated controls. All other treatments slightly reduced yields. All treatments (applied on 17 July, 1956) gave satisfactory control of Galinsoga parviflora, with the exception of MCPA + 2,4,5-T ester. J.L.M. [O.W.]

1649. PALFREY, G.D. (Summarizer). Potatoes (5 reports). Res.Rep.E.Sect.Nat.Weed Cttee, Canada, 1960, 5-8.

Simazine 1.5 and 2 #, trietazine 1.5 and 2 #, dalapon 3 # + dinoseb 3 #, and EPTC (incorporated) 3 # applied at emergence caused no injury and resulted in non-significant increases in potato yields. Both rates of simazine, trietazine 2 # and the dalapon/dinoseb mixture all gave excellent weed control.

In 1 trial over 2 years, no adverse effect on total solids content or cooking quality was caused by dalapon 7.4 #, dinoseb amine 8.6 #, diuron 2.4 #, simazine 2 #, or trietazine 2 #. No injury was caused to potato

foliage by mixtures of dalapon 3 # with the following: trietazine 2 #, diuron 2 #, dinoseb 3 qt (sic.), simazine 2 #, or atrazine 2 # applied immediately after hilling, or by 2 post-em. treatments with FW734 (3,4-dichloropropionanilide) 2 gal (sic.). The dalapon + atrazine mixture and FW734 gave the best weed control, the other treatments giving only poor to fair results.

None of the following applied at emergence affected potato foliage: simazine 3 #, dalapon 10 # ± dinoseb 3.6 # or ± simazine 3 #, dinoseb 3.6 #, 2,4-D ester 0.5 #, trietazine 3 #, diuron 2 #. The best control of Chenopodium album was obtained with trietazine (96%) and dalapon + dinoseb (92.6%) and of Echinochloa crusgalli with dalapon + simazine (85.7%) and dalapon alone (71.4%).

Dalapon 4 # + 6 # each + 2,4-D amine 0.5 # applied after 20% emergence reduced potato yields in a year of severe drought and gave only moderate weed control. When applied immediately after ridging and at about 1 month after planting, simazine 2 # caused slight foliage injury and significant yield reduction, whereas trietazine 3 # and diuron 2 # caused no injury and did not affect yield. All gave very good control of weeds, which were mainly Polygonum convolvulus, P. persicaria, and Chenopodium album.
D.M.L.S. [O.W.]

1650. FRANS, R.E. Effect on soybean yields of herbicide and narrow row width combinations. Publ.Arkansas Agric.Exp.Sta., 1959, pp.19.

Pre-em. naptalam, PCP and CDAA and, post-em. dinoseb amine have shown promise, in combination with narrow row-spacing, in reducing cultivations without reducing yield. Chlorpropham pre-em. has been too variable in effect. Where yield increases resulted they were most often from the narrowest (15-25 cm) row-spacings tried. From Agron. Trop.15,(4),471. - D.M.L.S.

1651. OTTO, H.J. and BEHRENS, R. (Minnesota Agric.Exp.Sta.,St.Paul,U.S.A.). Pre-emergence weed control in corn and soybeans. Farm and Home Sci., 1961, 18,(2), 3,18, figs.1,tabs.1.

The properties and advantages of using pre-em. herbicides are briefly reviewed. Grass and broad-leaved weeds were effectively controlled in maize by CDAA + trichlorobenzylchloride, atrazine and simazine, and in soybeans by amiben and naptalam. CDAA controlled annual grasses in maize and soybeans. Poor control was given by 2,4-D in maize and naptalam in soybeans. - M.G.G. [33(77.6)]

1652. FRANK, R. (Summarizer). Soybeans. White beans. Tobacco. Res.Rep.E.Sect. Nat.Weed Cttee,Canada, 1960, 17-22.

Soybeans (5 reports). Amiben at 3-6 # resulted in higher yields pre-em. than when incorporated pre-sowing or post-em. (16 days after sowing). In 1 trial, 6 # pre-em. gave the highest yield and the best weed control, whereas 4 # was not much better than 3 #; in another trial, however, 4 # gave excellent weed control. Dinoseb granular applied pre-sowing at 6 # gave good results with no injury. Dinoseb 3 # applied post-em. 11 days after sowing caused severe injury, but did not reduce yield; 2 # post-em. gave poor grass control. Dinoseb 3 # + CDAA 3 # caused slight injury with the liquid formulation but not the granular, but yields were higher than on the cultivated plots. Trietazine 3 # applied pre-sowing gave increased yield and no injury. The following caused injury: Niagara 5996 [2,6-dichlorobenzonitrile] 4 # a.i. incorporated pre-sowing, Geigy 34696 (2-chloro-4-ethylamino-6-methoxypropylamino-s-triazine) 2 # a.i. pre-em., naptalam granular 4 # pre-sowing and liquid 4 # pre-em. (the latter did not reduce yield), naptalam 2 # + chlorpropham 2 # pre-sowing, MCPB (sodium) 1 and 1.5 # and mecoprop 2.25 # both at the 2-3 node stage.

White beans (2 reports). In 1 trial Niagara 5996 4 # disced in pre-sowing and Geigy 34696 2 # applied pre-em. severely damaged the beans. In another trial naptalam 4 # and CPC 2019 (herbicidal oil with 80-90% aromatic hydrocarbons) 20 gal/ac applied pre-em. and dinseb 3 # post-em. (1 true-leaf stage) all reduced yields significantly; naptalam 2 # + chlorpropham 2 # post-em. (1 true-leaf stage) caused stunting and injury, and naptalam granular 4 # pre-em. thinned the stand and greatly delayed harvesting. Trietazine 4 # pre-em. gave the best results.

Snap beans. MCPB 1 and 1.5 # applied when beans were 8-12 in. high caused severe damage and greatly delayed maturity.
D.M.L.S. [O.W.]

1653. ORAM, P.A. (Borax Consolidated Ltd.,London,England). Experiments on the control of weeds in groundnuts in Tripolitania. Weed Res., 1961, 1,(3), 211-28, (g.f.), figs.1,tabs.8,bibl.20.

The trials described were carried out over 4 years (1954-7) in a summer-irrigated sandy coastal plain where early sowing is desirable. PCP 10 and 20 # applied pre-em. controlled the predominant annual dicotyledons (Portulaca oleracea, Thlaspi arvense

and Amaranthus retroflexus) as well as did hand-weeding during early growth, without injuring groundnuts and consistently rsulted in the highest groundnut plant populations, possibly because of its fungitoxicity; 2,4-D ester 0.5 and 1.5 # pre-em. also gave effective control, but the higher rate severely checked the groundnuts. The best results were obtained with a pre-em. mixture of PCP 10 # + 2,4-D 0.5 #, which in both trials resulted in yields higher than the weeded control; its effects persisted for about 10 weeks only and the highest yields resulted when it was supplemented by later hand-weeding. The following caused injury: monuron 3 # pre-em., TCA at 24 # applied 40 days pre-sowing, propham 10 # pre-em. which was also ineffective against weeds, and MCPB 1.8 # and 2,4-DB 2.5 #, both applied 1 week and 17 days after emergence.
Cultivation during early growth stages often damaged the crop and plots where cultivation was delayed for several weeks gave as good yields as those hand-weeded throughout growth.
Preliminary studies indicated varietal differences in susceptibility. - D.M.L.S. [O.W.]

1654. McRAE, G.N. (Agric.Exp.Sta., Tempe,Arizona,U.S.A.). Weed control in cotton with monuron and diuron applied during early stages of growth. Abstr. Weed Soc.Amer.Meet., 1960, 2. [Abstract].
In trials during 2 years (1) monuron 1.5-2.5 # and diuron 1.5-3 #, were applied at the 4-6 true-leaf stage before the first irrigation, (2) both herbicides at 1-4 # were applied when cotton was 15 in. high at the pre-blooming stage before the second irrigation, and (3) both at 1-2 # were applied twice at the same 2 growth stages as in (1) and (2). The cotton variety was Acala 44. Soil type in (1) and (2) was McClellan clay and in (3) a sandy loam. Results indicated that monuron at rates sufficient to control grass would be likely to stunt and reduce yield of cotton and that injury would be more severe in a light sandy soil and when cotton was treated at an early stage. Diuron was much less injurious and had a minimum effect on early cotton. D.M.L.S. [O.W.]

1655. * SANDHU, A.S. and SINGH, D. (Div.Bot.,Indian Agric.Res.Inst.,New Dehli 12,India). Preliminary studies on the effect of fertilizers on weed growth and yield of mustard (Brassica juncea Coss). Indian Oilseeds J., 1960, 4,(4),33-8.

1656. McCALLA, T.M. and ARMY, T.J. (Soil and Water Conserv.Div.,Agric.Res.Serv.,U.S. Dep.Agric.,Lincoln,Nebraska,U.S.A.). Stubble mulch farming. Adv.in Agron., 1961, 13,125-96, bibl.124.
Includes a section on weed problems in relation to stubble mulch farming. Grass weeds, especially Bromus tectorum, and broad-leaved weeds such as Salsola pestifer and Polygonum convolvulus are serious problems, partly because weeds are more difficult to control by conventional cultivation practices than where ploughing is practised. The use of chemicals in combination with stubble mulch tillage is considered to show promise, but more information on aspects such as residual toxicity is required before recommendations can be made. - P.J.B. [O.RE.]

1657. HAY, J.R. (Summarizer). Grass and legume crops. (5 reports). Res.Rep.E.Sect. Nat.Weed Cttee,Canada, 1960, 37-9.
2-methoxy-3,5,6-trichlorobenzoic acid (Velsicol C) 1 #, 2-methoxy-3,6-dichlorobenzoic acid (Velsicol B) 0.5 and 1 #, Compitox (mecoprop-potassium) 1.5 and 3 # a.i., 2,4-D amine 1 #, and MCPA amine 1 # all significantly reduced the stand of Vernal lucerne undersown in oats when sprayed 3 weeks after sowing, whereas Velsicol C 0.5 # and Geigy 34696 [2-chloro-4-ethylamino-6-methoxypropylamino-s-triazine] 1 and 2 # did not. Oat yields were not affected.
2,4-DB butyl ester 1.5 # and MCPA amine 0.25 # failed to control either Equisetum arvense 9 in. high or Taraxacum officinale in the flowering stage.
2,4-DB butyl ester 1.5 # gave nearly 100% control of seedling Barbarea vulgaris, but only moderate control of established plants in the rosette stage; 1 # was much less effective.
Five treatments with MCPA ester 1 # in spring and autumn gave 96% control of Ranunculus acris and were more effective than 5 treatments with 2,4-D ester ± fertilizers or fertilizers alone. After 3 treatments with MCPA 1 #, control was 79.5%.
Applied in June, 2,4,5-T ester 2 # gave nearly 100% kill of Spiraea tomentosa and was slightly better than 2,4-D ester 2 # or amitrole 4 #. Spraying the regrowth 2 months after mowing and raking proved less satisfactory than spraying without cutting. - D.M.L.S. [O.W.]

1658. IVON WATKINS, LTD. (Ivon Watkins,Ltd., New Plymouth,New Zealand). Spraying pastures.

Tech.Bull.Ivon Watkins,Ltd., [n.d.], T239, pp.5.
Observations are made on the choice of herbicides for the control of weeds in pastures and recommendations are given for the use of 2,4-D, MCPA, 2,4-DB and MCPB.
P.J.B. [O.W.]

1659. ROCCO, D.M. (Dominio di Doriano Estates,Naivasha,Kenya). Some trials on the use of dalapon for the control of grasses in lucerne. Proc.Couch Control Conf.E.Afr. Agric.Res.Org., 1960, 40-3, bibl.1.
See Weed Abstr.10:689. [O.W.]

1660. GOULDING, P.F. (Dept.Agric.,Hamilton, New Zealand). Control of regrowth docks in new pasture with 2.4-DB. N.Z.J.Agric., 1961, 103,(4),323, figs.1.
2,4-DB applied at 2.25 # in 20 gal water 6 weeks after sowing pastures and when the clovers have formed 2 true leaves, will prevent regrowth of Rumex spp. without damaging the sward. Costs per ac are given.
M.G.G. [O.W.]

1661. ROBERTS, H.W. (National Agric. Advisory Serv.,Shardlow,Derby,England). Chemical renovation of hill land in the north of Scotland. Trans.Roy.Highland and Agric.Soc.Scotland, 1960, pp.14, figs.8, tabs.5,bibl.6.
A brief account is given of the improvement of upland grazings by the use of dalapon and amitrole. The addition of 2,4-D at 1.5 # to dalapon at 3-15 # for use on mixed vegetation did not increase the degree of control of broad-leaved species secured by dalapon alone. Application of dalapon when plants were growing actively and after the sward had been burnt or grazed, gave the most effective control. Agrostis tenuis, Bromus mollis, Cynosurus cristatus, Deschampsia caespitosa, Molinia caerulea, Nardus stricta and Juncus squarrosus were very susceptible to dalapon, Agrostis stolonifera, Festuca ovina and Holcus lanatus moderately susceptible and Holcus mollis, Deschampsia flexuosa, Festuca rubra, Carex spp. and mosses relatively resistant. Data are given of the growth of Lolium perenne sown at different intervals up to 7 weeks after applying dalapon at 3 and 9 # to peat and sand soils in pots. L. perenne growth was reduced in all cases, especially where applied at 9 # and when L. perenne was sown shortly after applying the dalapon. Dalapon persisted longer in sand than peat. It was concluded that where 1-2 in. of rain falls after applying dalapon a period of 4-5 weeks should elapse between treatment and sowing seed mixtures and that dalapon was best applied in spring when active growth has begun. Practical considerations in using herbicides in the renovation of hill grazings are reviewed. - M.G.G. [37(411)]

1662. NETHERLANDS, NEDERLANDSE ALGEMENE KEURINGSDIENST. Aanwijzingen voor de veldkeuring van zaden van groenvoedergewassen. [Points to note in the field approval of forage and fodder crops.] Meded.ned.Keuringsd., 1960, 16,(12),117-18.
Weed species present as possible impurities in grass and clover seed of which particular note should be made for seed certification purposes in the Netherlands are listed. - P.J.B. [G.R.I.]

HORTICULTURAL, ORNAMENTAL AND PLANTATION CROPS

1663. STANNEK, G. (Inst.Landw.,Dtsch. Akad.Landw.,Berlin,Germany). Neuzeitliche Unkrautbekämpfung mit Ackerbürste und Unkrautstriegel im Pflanzengemüsebau auf dem Feld. [Modern weed control with cultivator and harrow in vegetable crops in the field.] Agrartechnik, 1960, 10, (12),555-7, figs.6.
Mechanical weed control in vegetable crops in East Germany is discussed in the light of trials in which good weed control was obtained with a recently developed cultivator, (working width 5 m with 3 rows of tines 20 cm long, about 10 cm apart), used 12-16 days after sowing, followed by harrowing, both along and across the rows, on crops which included cauliflower, cabbage, kohlrabi, brussels sprouts, thousand-head and narrow-stem kale, celery and leeks on medium/heavy soil. Light harrows were used before the cultivator on light soils, or when the crop was not sufficiently established.
J.L.M. [300(43)]

1664. HANF, M. (Landw.Versuchsstation der B.A.S.F., Limburgerhof,Germany). Bisherige Erfahrungen beim Einsatz von Alipur in Rüben-und Gemüse-kulturen. [Experiences up to now with the use of Alipur in beet and vegetable crops.] [Pap.read at] 4. Dtsche Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung,Hohenheim, 1961, pp.8, tabs.6.

The results of 3 years' trials with Alipur [OMU + BiPC] applied pre-em. to beet are reviewed [see also Weed Abstr. 10:831], and a table is given evaluating the effect of Alipur on the following crops, together with recommended application rates to those species marked with an asterisk: carrots*, parsley*, onions*, beets*, salsify*, beans*, spinach*, lamb's lettuce*, [Valerianella locusta], cucumber, celery*, leeks*, lettuce, brassica crops, tomatoes*, asparagus, stone fruits*, berry fruits*, strawberries, tree nurseries*, flower bulbs*, ornamental shrubs* and potted plants*. - J.L.M. [O.W.]

1665. IVON WATKINS, LTD. (Ivon Watkins, Ltd., New Plymouth, New Zealand). Specialised crop spraying. Tech.Bull.Ivon Watkins,Ltd., [n.d.], T246, pp.4.

For controlling weeds in carrots and parsnips, propazine 50% wettable powder pre-em. at 4 # on soils with high clay or organic matter content and 2 # on sandy or loam soils, applied in 40 gal water, is recommended. Other crops, such as brassicas, etc., can be safely sown at 4-5 months after applying propazine, but the soil should be thoroughly tilled beforehand to assist in dissipating residues. For controlling weeds in onion, chlorpropham 2-4 # either pre-em. or post-em. at the first true-leaf stage. For lettuce, chlorpropham 2-3 # in 30-40 gal water, applied immediately pre-sowing, is recommended. P.J.B. [O.W.]

1666. SAIDAK, W.J. (Summarizer). Vegetables. Res.Rep.E.Sect.Nat.Weed Cttee Canada, 1960, 40-68, tabs.32.

Beets (3 reports). Endothal gave variable results, and it was evident from a survey of 16 growers that it was dependant for success on adequate rainfall following treatment. Incorporation pre-sowing gave no advantage. Only 4 of the 16 growers found it economical. CDEC 6 and 8 # pre-em. gave good results in 2 trials.

Carrots (3 reports). Amiben 4 # (granular and liquid) pre-em. gave excellent results in spite of early injury; 8 # reduced the yield, and 4 # pre-planting caused no stand reduction. In 1 trial, Dicryl (N-(3,4-dichlorophenyl)methacrylamide) 3 and 4 # post-em. at the 1 true-leaf stage stunted and thinned the carrots. Prometon 4 # pre-em. completely inhibited germination.

Celery (1 report). 2,4-DB ester and salt 1-2 # and MCPB ester and salt 2 # applied 23 days after transplanting caused injury and failed to control Stellaria media or Portulaca oleracea. Dicryl 4 and 6 # (but not 2 #) and Solan (N-(3-chloro-4-methylphenyl)-2-methylpentanamide) 4-8 # applied post-transplanting also caused injury; yields were reduced by Dicryl but not by Solan.

Lettuce (1 report). Lack of selectivity at rates sufficient to give weed control was observed with liquid and granular formulations of chlorpropham, CDEC and CDAA, applied pre-em. and amiben and chlorpropham applied after thinning, on a muck soil.

Onions (3 reports). CDAA-T (CDAA + trichlorobenzylchloride), CDAA and chlorpropham alone or mixed, applied pre- or post-emergence, gave good results. Repeat applications of CDAA or chlorpropham at 6 or 8 # caused injury and yield reduction in 1 trial.

Peas (5 reports). Promising treatments included: simazine 0.75 + chlorpropham 0.5 # and trietazine 2 and 4 # applied pre-em. and chlorpropham 6 # and trietazine 2 # applied pre-em. and again post-em. (3-leaf stage). Amiben 2-4 # gave variable results and in 1 trial at 2 # (granular) pre-em. caused stunting. Solan 2 # was very effective against Raphanus raphanistrum and Chenopodium album in the bloom stage and caused no injury to peas sown 1 month before treatment. A 1:15 mixture of MCPA and MCPB at 1 and 1.5 # applied at growth stages ranging from 4- to 5- and 5- to 7-leaf stages caused no more than a slight check at the heavier rate to 3 out of 5 varieties. The addition of Zytron (O-(2,4-dichlorophenyl)-O-methylisopropylphosphoramidothioate) or CDAA to dinoseb gave improved control of annual grasses.

Snap beans (1 report). EPTC 4 # and propyl ethyl-n-butyl thiolcarbamate 4 # pre-planting incorporated, chlorpropham 6 # and amiben 4 # pre-em., and dinoseb 3 # at emergence all resulted in yields comparable with the hand-weeded control, but the dinoseb 3 # post-em. treatment ± CDEC or CDAA 3 # caused considerable stunting.

Sweet corn (6 reports). Fenac 2 # pre-em. caused injury and reduced yields; dinoseb 6 # pre-em. also reduced yields. Atrazine 2 # pre-em. gave consistently good weed control and yields and in the 1 trial where ipazine 2 # was applied pre-em. the results were outstanding. Four commercial formulations of 2,4-D 0.5-3 # applied at different stages post-em. all appeared to cause some injury. When 2,4-D amine 0.5 and 1 # was applied to 7 sweet corn varieties when 12 and 24 in. high, Iochief and Douglas Extra Early were the most susceptible and Seneca Chief, a late variety, the least. Simazine 1 and 2 # applied immediately after sowing gave higher yields when corn was hoed in the 3-leaf stage and killed at the 7- to 10-leaf stage, than

when simazine was applied without cultivation.
Tomatoes. (a) Direct-sown (2 reports). CDEC 4 # pre-em., TCA 3 # + potassium cyanate 16 # at emergence, and Solan 4 # and FW734 (3,4-dichloropropionanilide) 3 # post-em. (when 3 in. high) were promising. Solan 4 # at the 2-leaf stage caused severe scorch and stand reduction. Amiben 4 # pre-em. delayed emergence and caused stunting.
(b) Transplanted (6 reports). Good results were achieved with amiben, CDEC, Solan, chlorpropham and FW734 but in 1 trial early-season application of amiben, FW734, and Solan reduced the yields. Pre-planting incorporation of amiben and CDEC reduced the effect and, with amiben caused stunting. Simazine incorporated prior to transplanting was lethal even at 0.25 #. - D.M.L.S. [O.W.]

1667. HALL, B.J. Two new chemicals for weed control in vegetables and maize. Agric. Gaz.,N.S.W., 1961, 72,(8),393-8.
CDAA and CDEC were used pre-em. in trials in New South Wales to control grass and broad-leaved weeds in a number of vegetable and field crops. Good control was given by CDEC at 6 # in red beet and peas, and by CDAA at 4 # in gladioli. CDAA at 3 # did not give good weed control in peas. Applications of CDAA, made between September and May, are recommended for the following crops: onions, tomatoes, sweet corn, maize, cabbage, cauliflower, peas, beans and gladioli. CDEC has given satisfactory control at all seasons of the year, but, as it is more expensive than CDAA, it is recommended for use between May and September only in the following crops: lettuce, red beet, silver beet, cabbage, cauliflower, peas, beans, tomatoes, cucumbers, pumpkins, onions, carrots and capsicums. The crop seed should be sown in a moist seedbed not less than 0.25 in. deep. Watering between the time of sowing and crop emergence is essential, though excessive watering may cause damage. Band-spraying is more economical than broadcast spraying in row crops sown 3 ft apart. Sprays were applied satisfactorily from knapsack sprayers, using a fan nozzle. - M.G.G. [O.W.]

1668. ORSENIGO, J.R. (Everglades Exp.Sta., Belle Glade,Florida,U.S.A.). Primary evaluation of pre-planting and of pre- and post-emergence applied herbicides in vegetable and field crops, spring, 1961. Mimeo.Rep. Florida Everglades agric.Exp.Sta., 1961, 62,(1),pp.26, tabs.23.
In trials on organic soils in Florida, 57 herbicides were applied pre-sowing, pre-em. and post-em. to the following crops: sweet corn, oats, okra, soybean, groundnuts, southern pea, lima bean, pole and bush snapbean, squash, cucumber, red, white and chinese cabbage, radish, carrot, onion, escarole, endive, lettuce, romaine, pepper and tomato. The stage of growth of each crop at the time of post-em. applications is given. Herbicides tested included: amiben,fenac, non-ionic surfactant containing 0.1% alkylarylpolyoxyethylene glycols, chlorpropham, dimethyl 2,3,5,6-tetrachloroterephthalate (Dacthal), dinoseb, O-2,4-dichlorophenyl-O-methyl-isopropylphosphoramidothioate (Zytron), diuron, monuron, 3-(3,4-dichlorophenyl)-1-methoxy-1-methylurea (Herb.326), atrazine, 2-chloro-4-alkylamino-6-isopropylamino-s-triazine (G-34361), 2-chloro-4-ethylamino-6-(3-methoxypropylamino)-s-triazine (G-34696), 2-methylmercapto-4-6-bis(isopropylamino)-s-triazine (G-34161), ametryne, prometon, atraton, Plyac (A-C polyethylene 629 + non-ionic surfactants at 1 oz/50 gal), TCA, ethylene glycol (bis-trichloro)acetate, N,N-di-n-propyl-2,6-dinitro-4-trifluoromethylaniline (trifluralin), N,N-di-n-propyl-2,6-dinitro-4-methylaniline (dipropalin), N,N-dimethyl-α,α-diphenylacetamide, CDAA, Vegadex (CDEC), CDEC-K, 2,4-DEP, 2,6-dichlorobenzonitrile, endothal as disodium, di-N,N-dimethylcocamine, di-oleylamine and an unspecified amine salt, ethyl xanthogen disulphide, alkylated aryl poly ether alcohol, EPTC as Eptam 6E and Eptam technical, t-butyl di-n-propylthiolcarbamate, ethyl di-n-butylthiolcarbamate, propyl ethyl-n-butylthiolcarbamate, N,N-dimethyl-α,α-diphenylacetamide, 2,4-D dimethylamine salt at 1 #, together with 16 herbicides of unspecified composition (classified). Weeds present in the trial area were Digitaria sp., Eleusine indica, Amaranthus spinosus, Ambrosia sp., Portulaca oleracea and Cyperus rotundus. Herbicides applied pre-sowing were applied in 50 gal spray/ac and incorporated 2.5 in. deep with a blade, or sprayed on the surface and incorporated with a tined weeder. Pre-em. and post-em. herbicides were applied in 50 gal spray/ac at 25 p.s.i. Wind velocity and soil moisture at the time of application, rainfall during the first week after application and temperature for 3 weeks after application were recorded. Treatments were compared with hand- and unweeded controls and also with the standard herbicidal treatment of CDEC 4 # pre-em.
Pre-sowing treatments. The crops appeared to be slightly more tolerant of scratch than blade incorporation. CDAA, CDEC and fenac incorporated by blade were ineffective against weeds and caused damage to

crops not usually damaged by pre-em. herbicides. Effective control of broad-leaved weeds was given by fenac 4 #, of grass weeds by EPTC 4 # ± Plyac, 2,4-D or CDEC 3 #.

Pre-emergence treatments. Crops were tolerant of amiben 4 #, CDAA 4 # ± Plyac, CDEC 4 # ± Plyac, CDEC 4 # + monuron, fenac 4 #, atraton 4 #, trifluralin 4 #, Zytron 10 #, dinoseb 1.5 # + 2,4-DEP 4 #, dinoseb 3 # + 2,4-DEP 4 and 6 # and 6 herbicides of unspecified composition. Effective control, especially of grasses, was given by CDAA 4 # + dinoseb 2 #, 2,4-D, diuron 2 #, monuron 2 #, Zytron 5 #, Plyac, CDEC-K 4 #, CDEC 4 # + Plyac, monuron 1 #, diuron 1 #, Dacthal 5 #, Zytron 5 # and TCA ester 4 #, G-34161 4 #, ametryne 4 #, Herb 326 3 and 6 #, trifluralin 4 #, dinoseb 1.5 # + 2,4-DEP 4 #, dinoseb 3 # + 2,4-DEP 4 and 6 # and 4 classified herbicides. Three of the classified herbicides and trifluralin and Herb 326 were thought worthy of further investigation. CDEC, EPTC and TD 306 (unspecified) gave the best all-round performance.

Post-emergence treatment. No herbicide was sufficiently non-phytotoxic to the crops to be acceptable in practice. Good initial weed control was given by atrazine 3 # ± surfactants, diuron 2 # ± surfactants, prometon 3 #, atraton 3 #, and 3 classified herbicides. Excellent control of weeds, including Cyperus rotundus, was given by Herb 326 2-3 #, G-34161 3 #, and ametryne 3 #. The longest residual control was given by ametryne. In all trials, the general performance of CDEC 4 # pre-em. was superior to the other chemicals tested. - M.G.G. [51(75.9)]

1669. ASHTON, F.M. (Univ.California, Davis,U.S.A.). Weed control in tomatoes. Proc.13th Annu.California Weed Conf., 1961, 109.

CDEC and propyl-ethyl-n-butylthiolcarbamate applied pre-em. at 2-4 # and incorporated to a depth of 2 in. have respectively, given control of pigweed [Amaranthus sp.] and watergrass [Echinochloa crusgalli] in tomatoes and can be used in combination at these rates for total weed control. - M.G.G. [O.W.]

1670. GREEN, D.H. (Trop.Pesticides Res. Inst.,Arusha,Tanganyika). The effect of loss of leaf area on the flowering and fruit production of dwarf French beans. Misc.Rep. Trop.Pesticides Res.Inst., 1961, 307, pp.4, tabs.1.

Flower and fruit production of dwarf French beans appeared to be unaffected by loss of up to 0.5 their leaf area either when the leaves were newly emerged, or when the first trifoliate leaf had fully expanded. Applications of dinoseb at these stages should minimise the effects of damage caused by herbicidal leaf scorch. - M.G.G. [12(678)]

1671. RIES, S.K. (Michigan Agric.Exp.Sta., East Lansing,U.S.A.). Practical weed control in the nursery. Amer.Nurseryman, 1961, 113, (8),11,128,illus.

General recommendations on the use of herbicides and fumigants from Michigan State University. Hort.Abstr.31:4961.

1672. CHADWICK, L.C. and REISCH, K.W. Simazine affects oats as a fall cover crop for evergreens. Ohio Fm Home Res., 1961, 46(5),71, tabs.1.

Simazine was applied at 1.5 and 3 # to a silt loam soil in 1 gal containers, oats were sown 2, 4, 6, 8, 10 and 12 weeks later and their percentage germination recorded. From the results, it was concluded that oats could safely be sown in small evergreen nurseries as an autumn cover crop 8-10 weeks after applying simazine at 1.5 # and 10-12 weeks after applying 3 #. - M.G.G. [O.W.]

1673. BOYCE, J.H. (Summarizer). Turf (11 reports). Res.Rep.E.Sect.Nat.Weed Cttee Canada, 1960, 96-104, tabs.8.

Control of Digitaria sanguinalis. Zytron (O-(2,4-dichlorophenyl)-O-methylisopropylphosphoroamidothioate) spray 15-20 # applied pre-emergence of crabgrass gave excellent control, but in 1 trial where applied post-em., 30 # was required for complete kill; the granular formulation used pre-em. was less dependable. Only temporary injury was caused to turf grasses from the pre-em. treatments; 30 # post-em. killed bent grass [Agrostis sp.] and fescue [Festuca sp.] but stimulated blue grass [Poa pratensis]. Used pre-em. (of crabgrass), Dacthal (dimethyl 2,3,5,6-tetrachloroterephthalate) granular 10-15 # gave variable results and the liquid (in 1 trial only) excellent results. Calcium arsenate 6-15 # was much less effective than either Zytron or Dacthal. In the post-em. trial, potassium cyanate 1 oz/3 gal/400 sq.yd applied 3 times during summer killed the crabgrass with only slight turf injury. Disodium methyl arsonate 6 lb/100 gal/ac and ammonium methyl arsonate 4 lb/200 gal/ac were much less effective and FW 734 (3,4-dichloropropionanilide) ineffective.

Other turf weeds. Fenoprop 1.5-2 # and mecoprop 1.5-2 # applied April-August and at 2 # applied in late autumn both gave

excellent control of turf weeds, including Stellaria media, Cerastium vulgatum, Trifolium repens, Glechoma hederacea, Medicago lupulina, and Polygonum aviculare without causing more than slight temporary injury to turf grasses, but did not always kill Taraxacum officinale or Achillea millefolium. In addition, Linaria vulgaris and Cichorium intybus were resistant (in 1 trial) to mecoprop. S. media was also controlled by September applications of neburon and fenoprop both at 1 #.
Mecoprop 1.5 # caused no injury to 2 varieties of bent grass when applied 8 days before sowing or 6 days after. _ D.M.L.S. [O.W.]

1674. SPORTS TURF BULLETIN. Pratia angulata. Sports Turf Bull., 1961, (55),5.
A brief note is given on Pratia angulata, an occasional turf weed of New Zealand and which was introduced into Gt Britain about 25 years ago. It is now established in the Royal Botanic Garden, Edinburgh, and at the Sports Turf Research Institute, Bingley, where it is spreading in turf. P.J.B. [O.W.]

1675. ORCHARDIST OF NEW ZEALAND. Weed control. Runner beds. Orchard.N.Z., 1960, 33,(5),160.
The most promising material for controlling weeds in strawberry runner beds was 2,4-DES 6 #, which gave fair weed control and did not reduce runner production. From Biol. Abstr.,Sect.D,36:50244. - J.W.F.

1676. WHITE, R.G. (Summarizer). Fruits Res.Rep.E.Sect.Nat.Weed Cttee Canada, 1960, 69-82, tabs.12.
Apples (4 reports). Diuron and simazine alone and in mixtures with amitrole, amitrole T (amitrole + ammonium thiocyanate), or dalapon gave excellent season-long control of Agropyron repens and broad-leaved weeds without visible injury to 12-year-old apple trees; atrazine was less effective. Similar results were obtained with dalapon 10 + 2,4-D 1 # + simazine or atrazine 8 # without injury to 5-year-old trees. Amitrole 19 and 38 # caused moderate to severe leaf injury to 11- and 12-year-old trees; nevertheless growth increases resulted from control of weeds, which was enhanced by the addition of simazine. In a pot trial, 1-year-old trees showed a range of susceptibility to simazine and diuron and also, but less so, to amitrole.
Orchard weed control (1 report). Amitrole T showed no advantage over amitrole in 1 trial. Diquat dibromide 4 # controlled weeds for only 3 weeks.
Lowbush Blueberries (1 report). Autumn application of fenoprop 8 #, 2,4-D butyl ester 4 # and MCPB ester 8 # followed by spring burning markedly reduced Kalmia angustifolia. Blueberry populations were increased the following September, but were well below that of the burned-only control. Fenoprop appeared slightly superior to 2,4-D, and MCPB inferior.
Cranberries (3 reports). Aromatic oil (CPC 2019) appeared promising for dormant-season application. Diuron showed promise at rates lower than 6 #, which gave very good weed control but caused moderate injury when applied in July. Varsol 200 gal/ac gave poor control of woody plants and caused moderate injury when applied in July, but not apparently when applied in May. July application of amitrole 8 # caused stunting and may have reduced yields.
Grapes (1 report). Herbicides were applied on 27 May. The main weeds were Chenopodium album, Amaranthus retroflexus, grasses and Portulaca oleracea. Diuron 3 # gave season-long weed control without injuring 3-year-old vines, and atrazine 5 #, propazine 3 # and simazine 4 # were equally effective without injuring 25-year-old vines.
Raspberries (1 report). Applications on 5 May (when raspberries were coming out in leaf) of diuron 2 #, FW 734 (3,4-dichloropropionanilide) 4 #, and amitrole-T 2 # caused considerable cane injury. Granular chlorpropham 6 # or granular dalapon 1 # separately and together caused no injury, but were ineffective.
Strawberries (7 reports). (a) Summer treatment after spring planting. Trietazine 2-3 # gave excellent results, and simazine 1-2 # and EPTC 5 # good results in 3 trials; in another trial simazine 2 # caused some injury, but did not reduce % of rooted runners. Good results without injury were also obtained with amiben 2-6 #, neburon 2 #, CDAA granular 5 #, dinoseb granular 6 #, CDEC granular 6 #, and Solan (N-(3-chloro-4-methylphenyl)-2-methylpentanamide) 4 #. Atrazine 2 # was lethal and 1.5 # caused severe injury. Other injurious herbicides were: 2,6-dichlorobenzonitrile 4 #, dalapon 1 and 2 #, 2,4-DEP 4 #, Zytron (O-(2,4-dichlorophenyl)-O-methylisopropylphosphoramidothioate) 5 #, and neburon 4 # (but not 2 #). Var. Sparkle showed greater resistance to herbicides than Red Coat, while Premier and Senator Dunlop were comparatively susceptible.
(b) Autumn treatment. 2,4-D 1 # and chlorpropham 6 # reduced the next season's yields and trietazine 2 # increased them, but not significantly. - D.M.L.S. [O.W.]

1677. STOVELL, F.R. Control of weeds in fruit. Essex Fmrs' J., 1961, 39,(11),33, 35-6.
MCPA 1-2 # will control docks [Rumex spp.], nettles [Urtica spp.] and creeping buttercups [Ranunculus repens] in apple and pear orchards with causing tree damage. Couch [Agropyron repens] and other grasses may be controlled by dalapon 6 # applied in spring or autumn or by amitrole 4-6 # applied before fruit set or after picking. Simazine 1-2 # may be used to maintain a clear area around the collar of the tree and should be applied before February. Bindweed [Convolvulus arvensis] and creeping buttercup in blackcurrants may be controlled by a September spray of MCPB 2 # when the bushes are dormant. Simazine 2 # applied annually will control annual weeds and should be applied to blackcurrant plantations in February-March after cultivation. From Hort.Abstr. 31:3908. - J.W.F.

1678. ROGERS, B.L. (Maryland Agric. Exp.Sta.,College Park,U.S.A.). Chemical weed control in apple orchards - preliminary report. Rep.Md agric.Soc. 1959, 1960, 44,81-5, tabs.5,bibl.2.
Spring applications of monuron 1.6 # and simazine 2 # applied to bare soil around 2- to 3-year-old Golden Delicious apple trees gave excellent weed control without injuring the apples, even when applied for 2 years in succession. Simazine had a longer residual effect than monuron. 2,4-DES 1.8-3.6 and 5.4 # caused no injury, but gave poor weed control. Simazine 1, 2 and 4 # applied at the end of May caused no injury to Rome apple trees planted earlier in the spring.
In trials during 3 years in which herbicides were applied in the spring to vegetation around apple trees with or without prior cultivation in the autumn, dalapon 7.1 + amitrole 4.8 # gave consistently good results and better broad-leaved control than dalapon mixed with 2,4-D 1.6 #. No injury to mature Stayman, Rome, or York apple trees was recorded.
D.M.L.S. [117(75.2)

1679. BREVES, J. Die chemische Unkrautbekämpfung in Holsteiner Baumschulen. [Chemical weed control in Holstein nurseries.] Gartenwelt, 1961, 61,44-5.
Recommendations are made for both seed- and plant-beds. Hort.Abstr.31:4963.

1680. SHAULIS, N. and JORDAN, T.D. (Dept.Pomology,N.Y.State Agric.Exp.Sta., Geneva,U.S.A.). Chemical control of weeds in New York vineyards. Ext.Bull.New York State Coll.Agric., 1961, 1026,pp.15, figs.3, tabs.3.
See Weed Abstr.9:62. It is stressed that the maximum permitted legal rate of herbicide per ac for use in the between-row area is half that for under-trellis weed control. Recommended rates for the use of diuron, monuron and oil-dinoseb emulsions are given.
M.G.G. [137(74.7)]

1681. ROCHECOUSTE, E. (Sugar Res.Inst., Reduit,Mauritius). Future trends in the chemical weeding of cane fields in Mauritius. Rev.agric.suc.Maurice, 1960, 39,(4/5),264-70.
The principal weeds considered are Cynodon dactylon, Paederia foetida and Digitaria timorensis. With regard to C. dactylon, it has been found that the 4 varieties which exist in Mauritius have different degrees of resistance to TCA and dalapon. Herb.Abstr. 31:692.

1682. FARWELL, D.E. A "smother crop" for weed control. Sugar J., 1961, 23,(11), 14-16 and 18-20, figs.4,tabs.1,bibl.7.
Cultural and chemical methods of controlling Sorghum halepense in sugar cane are discussed. The possibilities of using clovers, especially Hubam and Floranna sweet clovers [Melilotus alba var. annua] as smother crops as part of a rotation system, in combination with 2,4-D and TCA, are reviewed and a procedure for using sweet clover, sown in autumn, and ploughed under in the following June before planting cane and applying 2,4-D, is given.
P.J.B. [33(76.3)]

1683. DIEKMAHNS, E.C. Cultivations in sisal fields. Bull.Kenya Sisal Bd, 1960, No.34,19-20.
In a cultivation trial started at Mlingano, Tanganyika, the initial first-cycle results showed that clean weeding resulted in the highest fibre yields, but yields fell appreciably in subsequent cycles. In a cover-crop trial, clean weeding was compared with covers of grass (Panicum trichocladum) and Peuraria phaseoloides and Dolichos argenteus. On the second-cycle land, the clean weeding treatment has given the highest yield to date, but the Kudzu (P. phaseoloides) was the best of the other 3 cover-crop treatments. A factorial manurial trial also showed the value of a legume cover. From Hort.Abstr.31:2821. - J.W.F.

1684. BARBOSA-CUPELES, J.E. and LUGO-LOPEZ, M.A. Use of allyl alcohol as a pre-emergent weedkiller in coffee seedbeds. J.agric.Univ. Puerto Rico, 1961, 45,(2),112-15, illus.
Allyl alcohol 2 gal/1000 sq.ft was very effective in killing weeds. Biol.Abstr. Sect.D.36:54090.

1685. GOSNELL, J.M. (E.Afr.Tanning Extract Co.,Ltd.). Application of dalapon in wattle plantations. Proc.Couch Control Conf.E.Afr. agric.Res.Org., 1960, 44-5.
See Weed Abstr.10:689. [O.W.]

1686. HOLMES, G.D. (Forestry Res.Sta., Wrecclesham,Farnham,Surrey,England). Chemical weed control in forests. Span, 1961, 4,(4),180-3, figs.3, bibl.10.
The control of woody, herbaceous and grass weeds by herbicides in forests is reviewed. M.G.G. [O.W.]

1687. UHLIG, S. and ZENTSCH, W. (Forstbotanisches Inst.,Tharandt,Germany). Unkrautbekämpfung mit W 6658 in Forstpflanzgärten. [Weed control with W 6658 in tree nurseries.] Forst u.Jagd, 1961, 11,(2), pp.2.
Recommendations are given for controlling weeds in tree nurseries with W 6658 [simazine]. W 6658 at 3-4 kg/ha in 600-1000 l water applied pre-em. (weed) or at emergence (weed) to moist soils in the spring gives good control of the following weeds until the autumn: Thlaspi arvense, Spergula arvensis, Poa annua, Capsella bursa-pastoris, Lamium purpureum, Viola tricolor and Stellaria media. The following weeds are resistant: Cirsium arvense, Convolvulus arvensis, Agropyron repens, Aegopodium podagraria, Rumex acetosella, Polygonum aviculare, Rorippa sylvestris and P. convolvulus.
The following tree species are cited according to their sensitivity to W 6658 3-4 kg/ha: (a) very resistant: Quercus rubra, Q. sessilis, Q. robur, Picea excelsa; (b) resistant: Acer pseudoplatanus, A. platanoides, Pseudotsuga taxifolia, Sorbus aucuparia, Alnus glutinosa, Carpinus betulus, Pinus sylvestris, Tilia cordata, T. platyphyllos, Robinia pseudoacacia, Aesculus hippocastanum, Pinus nigra, Picea sitchensis and Abies pectinata; (c) sensitive: Fraxinus excelsior and Larix decidua. W 6658 may be applied pre-em. (weed and crop) to seed-beds of Quercus spp. without crop damage. - J.L.M. [312(43)]

1688. SILKER, T.H. (Texas Forest Service, Kirbyville). The ecological approach and use of prescribed burning in Southern pine sylviculture. Iowa State J.Sci., 1960, 34,(4),661-84, figs.5,tabs.2,bibl.24.
The results are given of studies on the use of prescribed burning in hardwood/pine woodlands in the Gulf Coastal Plain areas of the southern USA as a means of reducing competition from the hardwood component and thus promote pine regeneration and dominance. Southern pine is now regarded as normally constituting a sub-climax group in the study area. - P.J.B.

BIOLOGY OF WEEDS AND POISONING BY WEEDS

1689. GRÜMMER, G. (Ernst-Moritz Arndt Univ.,Greifswald,Germany). The role of toxic substances in the interrelationships between higher plants. Symposia Soc.for Exp.Biol.,XV,Mechanisms in biological competition, 1961, 219-28, bibl.24.
Examples are given of the effect of a toxin exuded by the roots of Agropyron repens on various crop plants, including oats, kale, rape and tomatoes, agropyrene, an essential oil with antibiotic properties, has been isolated. Artemisia absinthium appears to inhibit the growth of neighbouring plants and to contain several growth inhibiting substances, including absinthin in the leaf hairs. This substance is easily washed from the leaves to the soil. Other species of Artemisia also contain toxic substances. An unidentified toxic compound has been shown to be washed out of the leaves of Camelina alyssum by rain and to reduce considerably, the growth and yield of flax. - M.G.G. [316(43)]

1690. * KOLEV, I.D. Neoteny in weeds. Vest.Sel'skokhoz.Nauki, 1960, (9),150-2.

1691. HIRONAKA, M. (Univ.For.Wildlife Exp.Sta.,Moscow,Idaho,U.S.A.). The relative rate of root development of cheatgrass and medusa head. J.Range Mgmt, 1961, 14,(5),263-7, figs.4,bibl.8.
A comparison of the rate of root development of Bromus tectorum and Elymus caput-medusae, was made by means of a new technique employing cloth tubes filled with soil which were planted in the field and examined at regular intervals. The results showed no significant difference

in the rate of development and the study failed to explain why E. caput-medusae is able to replace B. tectorum and become the dominant after invasion, although the fact that E. caput-medusae reaches maturity later than B. tectorum may explain why it is able to invade stands of the latter after it has matured in areas having a surplus of soil moisture. Root development in two perennial grasses, Agropyron desertorum and A. intermedium, was slower than in E. caput-medusae or B. tectorum, which was thought to explain why range seeding with perennial spp. is often unsuccessful in areas dominated by the 2 annuals studied. - D.M.L.S. [O.W.]

1692. RAMAKRISHNAN, P.S. (Bot.Dep., Benaras Hindu Univ.,Varanasi-5,India). Ecology of Eclipta alba Hassk. Proc.Nat. Inst.Sci.India, 1960, 26,B,(4),191-204, bibl.39.

1693. RAMAKRISHNAN, P.S., (Bot.Dep., Benaras Hindu Univ.,Varanasi-5,India). Studies in the autecology of Euphorbia hirta Linn. J.Ind.Bot.Soc., 1960, 39,(3), 455-73, figs.7,tabs.11,bibl.37.

1694. * YASUE, T., KAWAI, Y. and OTA, K. [Studies on the hard seed of milk vetch (Astragalus sinicus L.) and germination and hard seed content of milk vetch.] Bull.Gifu Univ.Facul.agric.Res., 1959, 11,6-11.

1695. GOTTLIEB, J.E. (Univ.Pittsburgh, Pennsylvania,U.S.A.). An experimental study of the shoot system of the bracken fern, Pteridium aquilinum. Amer.J.Bot., 1961, 48,(6),Pt 2,527. [Abstract].
The shoot of Pteridium aquilinum develops from a simple, upright, leaf-bearing form into a complex system which produces fronds only on relatively small, slow-growing, lateral branches or short shoots, the fast-growing, long shoots remaining typically leafless. At levels of sucrose in the plants below 2%, a rhizomatous sporeling plant could be held indefinitely in the leaf-bearing state. Its slender, spindly rhizomes produced leaves alternately to the right and to the left on the dorsal part of the stem at intervals of about 1 mm. At levels of >2% sucrose, the short-shoot habit became established, though reversion to the simple rhizome state could be induced at any time by reducing the carbohydrate level of the plants. - P.J.B. [O.W.]

1696. WILKINSON, R.E. (U.S.Dep.Agric., Delta Substation,Clarkedale,Arkansas,U.S.A.). Effects of reduced sunlight on water star-grass (Heteranthera dubia). Weeds, 1961, 9,(3),457-62.
The correlation between the growth of H. dubia and the percentage total light available was tested in an experiment which was repeated 6 times over a 7-month period. The plants grown in 23, 9.6, 5.8 and 2.8% of the available sunlight produced 64, 37, 37, and 5%, respectively, as much growth in fresh weight as plants grown in unshaded aquaria. The average growth in fresh weight obtained in 2.8% of full sunlight was not significant. The growth in 2.8% of full sunlight was significantly greater (1% level) than 0% only during the period June 10-July 8. Plant growth during the 1959 season increased as the season progressed and attained a maximum during the period June 10-July 8. Growth decreased thereafter to the end of the experiment in October. From author's summary. - D.M.L.S. [O.W.]

1697. * STOJANOVIC, D. A contribution to the knowledge of species and varieties of Cuscuta on the territory of North Serbia. Zastita Bilja, 1959, 54,21-7.

1698. GILL, L.S. and HAWKSWORTH, F.G. [Rocky Mt.For.and Range Exp.Sta.,Fort Collins, Colorado,U.S.A.]. The mistletoes. A literature review. Tech.Bull.U.S.Dep.Agric., 1961, 1242, pp.87.
This review is based on some 800 literature references to the Loranthaceae and covers taxonomy, growth and reproduction, physiology and parasitism, biotic and physical factors which affect mistletoe, mistletoes as useful plants and as destructive parasites in different parts of the world, and the control of mistletoe by physical removal and by chemicals. - P.J.B. [49(78.8)]

1699. GORDINIER, E.J. and HEATH, R. Improving wildlife habitat with herbicides; the use of herbicides in wildlife habitat management. Mich.Dep.Conserv.Game Div. Inform.C., 1959, 117,pp.7. See Weed Abstr. 10:1425.

1700. * NIKITINA, E.V. Yadovitye, vrednye i nepoedaemye rasteniya pastbishch Kirgizskoi SSR. [Poisonous, harmful and inedible plants of the pastures of Kirghiz SSR.] Frunze, Akad.Nauk Kirgisskoi SSR, 1959, pp.79.

1701. SCHWARTING, A.E. (Sch.of Pharmacy, Univ.Connecticut,Storrs,U.S.A.). Poisonous plants. [Continued in] Toxicology.Mechanisms and analytical methods,Academic Press,Ltd., 1961, Vol.2,737-54, figs.4,bibl.29.
Reviews the different classes of toxic substance occurring in poisonous plants, most commonly associated with poisoning in human beings, and the plant species which contain them. - P.J.B. [30(74.6)]

AQUATIC AND WOODY WEEDS AND THEIR CONTROL

1702. NEUBERT, E. (Univ.Greifswald,East Germany). Volkswirtschaftliche Bedeutung und betriebswirtschaftliche Gesichtspunkte des Greifswalder Grabenunkraut-Bekämpfungsgerätes "- der direkte und indirekte Nutzen". [Economic significance and operational aspects of the "Greifswalder ditch-weed control apparatus "- the direct and indirect agricultural use.] Dtsch.Agrartechnik, 1961, 11,(1),25-7, tabs.3,bibl.1.
Includes an appraisal of the economic advantages of the use of chemicals for controlling weeds in ditches, together with the operating costs of a prototype sprayer used in Greifswald, East Germany. - J.L.M. [293(43)]

1703. JACKSON, L.P. (Summarizer). Aquatic weeds (1 report). Res.Rep.E.Sect.Nat.Weed Cttee Canada, 1960, 105, tabs.1.
Urab (fenuron/TCA) 20 gal/100 gal water and Garlon (dalapon diethylene glycol 50.8%, fenoprop propylene glycol butyl esters 7.7%) at 4 gal/100 gal water both gave 100% control of Alisma plantago-aquatica, Typha sp., Scirpus americanus and of various grasses when applied on June 30 along the course of a ditch; 5 gal/100 gal and 2 gal/100 gal, respectively, were only slightly less effective. Kuron (fenoprop) 6 gal/100 gal was less effective, especially against A. plantago-aquatica. - D.M.L.S. [O.W.]

1704. WIFFEN, E.E. (Dow Chemicals (Canada) Ltd.,Sornia,Ontario,Canada). Aquatic weed control. Proc.14th Meet.W.Sect.Nat.Weed Cttee Canada, 1960, 17-23.
Some advantages and disadvantages of aquatic weed control are given. Kuron, the propylene glycol butyl ether ester of fenoprop, is recommended for the control of a wide range of aquatic species. Emergent species including Typha spp., Nuphar spp., Nymphaea spp., Pontederia cordata, Sagittaria sagittifolia, and Butomus umbellatus have been controlled by 4 lb in 100 gal water applied by boom or preferably by jet nozzle, when the weeds are in active growth. Fenoprop applied at an optimum temperature of 65°F or more, by boom or by hand sprayer to small areas, when the propellor of the application craft provides turbulence to mix the herbicide, gave control of the following submerged and floating species in Northern USA and Canada: Nymphaea sp. and Pontederia cordata at 0.5 p.p.m., Nuphar spp., Heteranthera spp. and Myriophyllum heterophyllum at 1 p.p.m., Utricularia spp., Braseria schreberi, Ceratophyllum demersum, Cabomba caroliniana, Elodea canadensis, Najas flexilis, Eleocharis spp., Callitriche spp., Juncus effusus, Scirpus americanus, and Sparganium spp. at 2 p.p.m. Potamogeton spp. and Vallisneria americana in Canada were tolerant of 2 p.p.m. Algae were unaffected. Some of the treatments gave control for 2 years. Maximum control of Ceratophyllum demersum in tanks was obtained in water with a pH of 7.0 or less and a calcium content of 250 to 500 p.p.m., though under field conditions pH had little effect on control. Fenoprop cannot be used in water intended for drinking or agricultural use, but weeds in ditches containing water for agricultural use may be controlled with fenoprop if the water is allowed to stand for 48 hours and then flushed from the ditch. The herbicide is non toxic to fish at 2 p.p.m. and its slow rate of action does not result in rapid depletion of oxygen content of the water. M.G.G. [O.W.]

1705. SCHMIDT, G. Mit dem "Greifswalder Grabenunkraut-Bekämpfungsgerät" zu einem neuen Verfahren der chemischen Entkrautung von Ent - und Bewässerungsgräben. [With the Greifswald weed control ditch sprayer for a new method of chemical weed control of drainage and irrigation ditches.] Dtsch. Agrartechnik, 1961, 11,(1),21-5, figs.10, tabs.2,bibl.2.
In a review of the chemical weed control of ditches, a description is given of a ditch sprayer, and two accessories, which can be mounted at the end of the side arm carrying the spray boom, to increase the efficiency of herbicide application. The accessories are: (1) a share for clearing the floors of ditches during spray application, and (2) large tines for injecting herbicide into the root area of the weeds. In trials, good results were obtained with dalapon 15 g/m^2, dalapon 10 g/m^2 + agrosan [$NaClO_3$] 20 g/m^2 and W 6658 [simazine] 5 g/m^2 applied either (a) pre-em. (weed) in

April, (b) to both roots and foliage of sparsely growing weeds by use of the injection share, or (c) to foliage of vigorous weed stands. A table gives data of the sensitivity of 18 weed species to dalapon. - J.L.M. [310(43)]

1706. JOHANNES, H. (Biol.Bundesanstalt, Braunschweig,Germany). Über synergistische Encheinungen in Labor - und Gewachshausversuchen zur Bekämpfung submerser Pflanzen. [Concerning synergistic phenomena in laboratory and glasshouse trials on the control of underwater plants.] [Pap.read at] 4. Dtshe Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung, Hohenheim, 1961, pp.3.
The results of trials are reported in which the effect of simazine, atrazine, amitrole, simazine + amitrole and atrazine + amitrole on 3 hydrophytic plants in pond water was determined. Simazine 2.5 p.p.m., amitrole 210 p.p.m., atrazine 10 p.p.m., simazine 0.2 + amitrole 80 p.p.m. and atrazine 1.4 + amitrole 20 p.p.m. gave complete control of Riccia fluitans, represented in the trials by portions of thallus apices each showing three-fold branching. Simazine 0.5 p.p.m., amitrole 160 p.p.m., atrazine 1.4 p.p.m., simazine 0.2 + amitrole 40 p.p.m. and atrazine 1.7 + amitrole 40 p.p.m. gave complete control of Lemna trisulca, represented in the trials by fertile thalli. Simazine 0.5 p.p.m., amitrole 80 p.p.m., atrazine 0.7 p.p.m., simazine 0.01 + amitrole 20 p.p.m. and atrazine 0.35 + amitrole 10 p.p.m. gave complete control of Callitriche stagnalis. - J.L.M. [O.W.]

1707. * KESSLER, S. Eradication of blue-green algae with copper sulphate. Bamidgeh, 1960, 12,(1),17-9.

1708. * HORTON, S.J. The problem of phreatophytes. Intern.Assoc.Sci. Hydrology.Symposium of Hannoversch-Münden, 1959, V.1,76-83.

1709. FOSSE, R.A. (Amchem Products, Inc.,Niles,California,U.S.A.). Formulation and brush control. Proc.13th Annu. California Weed Conf., 1961, 73-4.
Differences between formulations of 2,4-D and 2,4,5-T in effectiveness for brush control are outlined. - M.G.G. [O.W.]

1710. IVON WATKINS, LTD. (Ivon Watkins, Ltd.,New Plymouth,New Zealand). Control of blackberry (Rubus spp.). Tech.Bull.Ivon Watkins,Ltd., [n.d.], T-239,pp.2, figs.1.
Recommendations are given for the control of first- and second-year cones of Rubus spp. with 2,4,5-T. - P.J.B. [O.W.]

1711. IVON WATKINS, LTD. (Ivon Watkins, Ltd.,New Plymouth,New Zealand). Lupin control. Tech.Bull.Ivon Watkins,Ltd., [n.d.], T-247,pp.2.
Recommendations are given for the control of Lupinus arboreus, using 2,4-D for plants at a young stage, and 2,4-D + 2,4,5-T for plants at a woody growth stage. In pastures, L. arboreus in the seedling stage commonly shows resistance to MCPB and 2,4-DB and it is necessary to wait until the plants have passed the seedling stage and then spray with 2,4-D at low rates. Aerial spraying should be done during November to April. P.J.B. [O.W.]

1712. PLUMB, T.R. and BENTLEY, J.R. Rate of broadcast 2,4-D spraying on second-year chamise sprouts. Res.Note U.S.For.Serv. Pacific Southwest For.and Range Exp.Sta., 1960, 163,pp.7, figs.3,tabs.1.
The test area was cleared of chamise chaparral [Adenostoma fasciculatum] by burning in April 1956 and perennial grasses were sown in the following September. Plots were sprayed in May 1957 with 2,4-D or a 50:50 mixture of 2,4-D + 2,4,5-T at the following rates per acre: 2.6 lb in 13 or 26 gal emulsion, 5.2 lb in 13 or 26 gal emulsion. They were applied as low-volatile butoxy ethanol esters in 1 quart diesel oil per 10 gal emulsion. The percentage control was estimated in August of the same year and in June 1958. Adequate control was obtained only with the 5.2 lb rate in 26 gal/ac. Most of the original foliage was dead, and plants not killed were seriously weakened. Applying 5.2 lb in 13 gal/ac gave fairly effective control (64.5% top kill), but plants not killed remained vigorous and retreatment was necessary. At all rates, 2,4-D alone was as effective as the 2,4-D + 2,4,5-T mixture. Spraying at moderate rates with 2,4-D is recommended in late June or July of the first year, after burning in April, with respraying in the following spring. When spraying has to be postponed until the second year, and the plants are vigorous, a high rate of 6 lbs herbicide in 20 gal/ac is recommended. - M.G.G. [O.F.]

1713. STAEBLER, G.R. Basal injection of 2,4,5-T fails to kill red alder and bigleaf

maple. Weyerhaeuser Timber Co.Forestry Res. Notes, 1960, 23, pp.2.
Includes equipment.

OTHER WEEDS AND THEIR CONTROL

1714. LEEFE, J.S. (Summarizer). Biennial and annual weeds (3 reports). Res.Rep.E. Sect.Nat.Weed Cttee Canada, 1960, 114-16, tabs.3.

Spergula arvensis. When applied to seedlings, MCPA amine and mecoprop both gave excellent control at 0.75 #; CP 1815 (MCPA + 2,3,6-TBA) also gave very good control at 0.75 #, but FB 2 (diquat dibromide) 0.5 and 1 # was ineffective. When applied at the pre-bloom stage, in order to give 90-100% kill, mecoprop ester required a rate of 2.5 #; Karsil (N-(3,4-dichlorophenyl)-2-methyl-pentanamide) 1.75 #, and Solan (N-(3-chloro-4-methyl phenyl)-2-methyl-pentanamide, and Dicryl (N-(3,4-dichlorophenyl) methacrylamide) approx. 1 #; dinoseb, 2,4-D, MCPA, and MCPB were ineffective, even at 4 #. When applied during flowering, MCPA 0.75 # gave only about 50% control.

Ambrosia artemisiifolia. When applied pre-flowering, Dicryl required 1.5 # and Solan about 2 # to give 90-100% kill in 10 days; MCPB, mecoprop and dinoseb were ineffective even at 4 #.

Chenopodium album. With applications pre-flowering, 2,4-D amine, Karsil, Solan and Dicryl required about 1 # to give 90-100% kill in 10 days, mecoprop, MCPA, and MCPB/MCPA 15:1 mixture 1.75 #, MCPB about 2 #, and dinoseb 4 #.

Raphanus raphanistrum. With applications during the early flowering stage, 2,4-D, Karsil, Dicryl and dinoseb required about 1 # to give 90-100% kill in 10 days, Solan 1.75 #, and MCPA about 2.5 #. - D.M.L.S. [O.W.]

1715. BIBBEY, R.O. (Summarizer). Perennial weeds. (12 reports). Res.Rep.E.Sect.Nat. Weed Cttee Canada, 1960, 106-13, tabs.12.

Euphorbia cyparissias and E. esula. Fenac 10 # and 2,3,6-TBA 10-20 # gave outstanding results in 1 trial where fenuron/TCA 60 #, monuron/TCA 60 #, DMTT 75 #, amitrole 8 # and CP 1815 (MCPA + 2,3,6-TBA) 3 # were ineffective; mecoprop 6 # gave 90% reduction, with 40% regrowth the following year. In another trial, 300 # of Urox (monuron-TCA) was required to give any substantial control of E. cyparissias.

Silene cucubalus. When applied in August, fenoprop 2 # gave approx. 80-89% control and 4 # approx. 96% control. 2,4-D ester, MCPA, mecoprop, 2,4-D + 2,4,5-T and CP 1815, all at 2 #, were ineffective. With Urox 200-300 # was required to give effective control.

Bindweed [Convolvulus arvensis]. 2,4-D 1 # applied twice in June and September and fenoprop 1 # gave excellent control without injuring soybeans sown the following year; 2,3,6-TBA 6 and 12 # gave good control, but severely injured the soybeans. There was considerable regrowth the following year from fenac 4 and 8 #, CP 1815 0.75 and 1.5 #, mecoprop 1.5 and 2.25 #, amitrole 4 # and 2,4,5-T 1 #.

Cirsium arvense. When applied in May to var. horridum 5-7 in. tall, and to var. mite 6-8 in. tall, fenac 7.5-15 #, 2,3,6-TBA 10 #, and amitrole ± NH_4SCN + sticker 4 and 8 # all gave excellent control. Without the sticker, amitrole ± NH_4SCN was much less effective and the following were ineffective: MCPB 2 #, 2,4-D + 2,4,5-T 1:1 0.75 #, 2,4-DB 1.5 #, mecoprop 2 # and 2,3,6-TBA 2 # + 2,4-D 1 #.

Cyperus esculentus. EPTC 18 # gave 100% control without regrowth the following year on a sandy soil, whereas where 15 # was applied to a muck soil, 15% regrowth appeared the next year. Atrazine 10 # gave complete kill within 1 month of treatment, and 7.5 # 95% control. Ipazine was less effective and Hexachloroacetone, Chlorazine, prometon and propazine were unsatisfactory.

Equisetum arvense. Sodium chlorate ± boron or calcium nitrate, at high rates, and erbon 124 # gave good control; dalapon, TCA, concentrated Borascu (boron) and monuron, all ± MCPA, also neburon and amitrole gave poor results.

Agropyron repens. Very good control was obtained with monuron 20 #, erbon 124 #, TCA 45 + MCPA 1 #, and dalapon 18.5 # and moderate control with sodium chlorate 545 + sodium nitrate 200 or at 275 + MCPA amine 1 #.

Taraxacum officinale. Autumn treatment with either 2,4-D or fenoprop followed by ploughing 1 week later effectively killed established plants, MCPA amine 0.5 # applied in June gave good but not complete control of seedlings.

Ranunculus acris. MCPA ester 1 # applied 5 times during spring and autumn gave 96% control and 3 treatments gave 79.5% control. 2,4-D ± fertilizers and fertilizers alone, applied once in spring and autumn, were much less effective. - D.M.L.S. [O.W.]

1716. TUSTIAN, M.W. and RAPER, C.R. (May and Baker(Canada)Ltd.,Montreal,Canada).

Canada thistle (Cirsium arvense) control with the butyric weedkillers. Proc. 14th Meet. W. Sect.Nat. Weed Cttee, Canada, 1960, 13-16, bibl.5.
A short description of Cirsium arvense is given. It has been controlled more effectively by 2,4-DB and MCPB than by 2,4-D and MCPA. The β-oxidation of the butyric analogues is sufficiently slow to permit the herbicide to be translocated to the root system in the inactive state. MCPB sodium applied 24 oz/ac in spring at the early-bud stage when the plants were 6 to 8 in. tall, was slower in action, but gave more complete root kill than 2,4-DB ester 1 lb. Death of C. arvense foliage occurred after 10 to 14 days, and of roots up to a distance of 2 ft from the parent plant after 4 to 6 weeks. MCPB appeared to cause explosive cell reproduction of the cambium, which caused the cuticularized epidermis to rupture and allowed pathogens to enter and the stele to dry out. A mixture of MCPB + MCPA in the ratio of 15:1 has given very effective control. - M.G.G. [O.W.]

1717. WARREN, R. Weed challenges in Oregon. Proc. 9th Annu. Oregon Weed Conf., 1960, 5-6, tabs.1.
A survey of common weeds of Oregon, indicated that the more serious weeds in order of decreasing importance were: Canada thistle [Cirsium arvense], wild morning glory [Ipomoea sp.], quackgrass [Agropyron repens], tansy ragwort [Senecio jacobaea] and white top [Cardaria pubescens]. M.G.G. [O.W.]

1718. GREAT BRITAIN, MINISTRY OF AGRICULTURE, FISHERIES AND FOOD. Wild oats. Adv. Leafl. Minist. Agric., Fish. & Fd, 1961, 452, pp.8, figs.4, tabs.1.
Descriptions are given of Avena fatua and A. ludoviciana, with notes on their distribution in Great Britain and their biology. Cultural methods of control recommended include putting infested land down to grass for up to 10 years, cultivating to promote wild oat germination before the crop is sown, delayed sowing of cereals, or growing row crops, or late-sown or arable silage crops in which wild oats can be prevented from setting seed. Recommendations are given for the control of wild oats in spring barley and wheat with di-allate and barban and in sugar-beet and peas with propham or TCA. - M.G.G. [485(42)]

1719. LEUCHS, F. (Biol.Bundesanst.für Land-u.Forstw.,Inst.für Gemüsekrankheiten u.Unkrautforsch.,Fischenich/Cologne,Germany). Untersuchungen über die Wirkung des Aminotriazols zur Huflattich (Tussilago farfara). [Investigations on the action of amitrole on coltsfoot (Tussilago farfara).] [Pap.read at] 4. Dtsche Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung,Hohenheim, 1961, pp.5, bibl.8.
In trials in 1959-60, amitrole [rate of application not stated] was applied pre- and post-em. (of weed) to stands of T. farfara. At 2-3 weeks post-em., the main rhizomes of treated T. farfara plants showed undemarcated brown patches and the sclerenchymatous tissue became thread-like. Young subsidiary rhizomes and the apical shoot of the main rhizome were unaffected. The presence of amitrole in the subsidiary rhizomes was established only after the rhizomes were sprayed directly or where T. farfara plants were sprayed at the seedling stage. The following were recommended for the control of T. farfara: amitrole applied at a low rate to mature T. farfara plants, with a second application at a high rate 14 days afterwards, and amitrole used in a mixture with (a) NaCl, (b) ammonium thiocyanate and (c) fenac. - J.L.M. [O.W.]

1720. KNAKE, E. and SLIFE, F. (Dept. of Agron.Univ.Illinois,Urbana,U.S.A.). Controlling giant foxtail in Illinois. Illinois Univ.agric.Ext.C., 1961, 828,pp.6, figs.6.
A brief account is given of the biology of giant foxtail [Setaria sp.], and its control by cultural measures and by the use of herbicides pre-em. Herbicides recommended for use in maize are atrazine, simazine and CDAA and in soybeans, CDAA, naptalam and amiben. - M.G.G. [33 (77.3)]

1721. SOEMARWOTO, O. (Gadjah-Mada University,Jogjakarta,Indonesia). The lallang (Imperata cylindrica Beauv.) problem in Indonesia. Abstr.Pap.10th Pacif.Sci.Congr., 1961. pp.2, [Abstract].
The total area infested with I. cylindrica has been variously estimated as from 15-30 million ha. Its spread is helped by repeated burnings and by forest clearance for shifting cultivation. The problem prevails in one-time forest land, the transmigration areas where peasants lack mechanical tools to control it, and in plantations. Control measures include reafforestation, the establishment of permanent agriculture, and, in plantations, mechanical methods and the use of legume cover crops. - D.M.L.S. [20(91)]

1722. IVON WATKINS, LTD. (Ivon Watkins, Ltd., New Plymouth, New Zealand). Control of bracken fern. Tech. Bull. Ivon Watkins, Ltd., [n.d.], T-236, pp.2, figs.1.
Recommendations are given for the use of Weedone Brackontrol (4-CPA) for the control of Pteridium esculentum. Rates of 1.5 gal commercial product per ac in 40-50 gal water as soon as the fronds are fully expanded are recommended. This is said to give 80-90% control. - P.J.B. [O.W.]

1723. * NAIR, N.C. and DESHPANDE, M.B. A note on the occurrence of Acanthospermum hispidum DC. in Rajasthan. Bombay Nat. Hist. Soc. J., 1960, 57, (2), 441-2.

1724. * KOWNAS, S. Anaphalis margaritacea in Polen. [Anaphalis margaritacea in Poland.] Polska Akad. Nauk. Inst. Bot. Mater. Florystyazne i Geobot, 1959, 5, (2), 217-21.

1725. HOLLOWAY, J.K. (Agric. Res. Serv., 1301 University Ave., Berkeley, California, U.S.A.). Biological control of weeds - progress report. Proc. 13th Annu. California Weed Conf., 1961, 116-17.
The possibility of controlling Tribulus terrestris by introducing two weevil species that infest the seeds or stems of the plant and are able to reproduce only when fed on this plant, is discussed. Senecio jacobea is being controlled by the Cinnabar moth and Cytisus scoparius by a twig-boring moth. The spread of the seed weevil, introduced to control Ulex sp. is described, and also oscillations in the control of Hypericum perforatum by Chrysomelid beetles. - M.G.G. [O.W.]

1726. ISELY, D. (Iowa State Univ., Ames, U.S.A.). Weed identification and control. Iowa State Univ. Press, 2nd Ed., 1960, pp.400, $4.95.
Although this is a textbook written specifically for students, the second edition will be welcomed by all interested in weeds and weed control because the plant descriptions of the first edition are now enhanced by the addition of a large number of excellent illustrations by Mrs. Francis Fenske. Also added are 43 pages of identification keys, which consist of four based on flower colour and a separate one for woody plants. Though primarily devoted to weed identification, there is considerable information on the importance and characteristics of many of the weed plants of the north-central States of the USA, besides basic principles and recent advances in weed control; in addition, many other aspects such as toxicology of weeds, weed control by management and even the future of weed control are also considered. - R.J.C. [W.31(73)]

1727. MATTHEWS, L.J. (Dept. Agric., Wellington, New Zealand). Weed identification and control. Mayweeds and chamomiles. N.Z.J. Agric., 1961, 103, (4), 321, 323, figs.4.
Descriptions are given for the identification of Anthemis cotula, A. arvensis, Matricaria inodora, M. chamomilla and M. matricarioides, with brief notes on their control with herbicides, mainly MCPA + 2,3,6-TBA mixtures. - M.G.G. [O.W.]

1728. WILLIAMSON, A.C. (Fisons (Canada) Ltd., Calgary, Alberta). Prometone for industrial weed control. Proc. 14th Meet. W. Sect. Nat. Weed Cttee Canada, 1960, 2-4.
Prometon at 12-18 # has been effective against most annual and perennial broad-leaved and grass weeds. Most of the development of prometon in Canada, for total vegetation control, has been in mixtures with atrazine or simazine. Prometon has shown effectiveness against woody species and appears to be more effective than other triazines for the prevention of the recolonization of treated areas of bare soil with annual grasses. Oxalis corniculata has shown resistance to prometon. Suggested rates for total vegetation control on industrial sites are 12-18 # for prometon alone, or prometon 4.8-12 # + simazine or atrazine 10-15 #. In trials in New Brunswick, applications of prometon 10 # + simazine 5 # applied in spring, 1958, still gave 75% control of mixed stands of Agrostis spp. and wild raspberry [Rubus sp.] by August, 1960; simazine alone at 20 # was less effective and less persistent. In trials in Ontario, prometon + simazine again showed greater effectiveness and persistency for total vegetation control than simazine or atrazine alone and gave effective control of Cirsium arvense and Daucus carota for 3 seasons. In trials to control vegetation in railway ballast, prometon 5 # + simazine 5 # gave up to 96% control for 3 seasons. Against established grasses and broad-leaved weeds on a sandy soil, prometon at 9.6, 14.4 and 19.2 # gave 72, 91 and 96% control, respectively, 4 months after application; simazine 20 # gave 98% and atrazine 20 # 99.8% control over the same period. - P.J.B. [O.W.]

1729. BENNETT, J.M. (Summarizer). Weeds and brush in non-crop land. (a) Roadsides and rights of way (3 reports). Res.Rep.E. Sect. Nat.Weed Cttee Canada, 1960, 86-9, tabs.1.
Brush spp. Preliminary results showed little effect from fenuron (pellets or granular) on Crataegus sp., Malus sp., Berberis vulgaris or Rhamnus cathartica. 2,4-D + 2,4,5-T (2-0.5 lb/100 gal) and AMS 75 lb/100 gal gave complete or nearly complete kill of B. vulgaris and R. cathartica, but Crataegus sp. showed regrowth.
Roadside weeds. Atlacide-Chlorate (sodium chlorate 59%) and Polyborchlorate (sodium chlorate 35%, boron equivalent 13.2%) each at 1 lb/gal and also at 0.5 lb/gal + 2,4-D amine 0.32 lb/gal applied in June or July gave equal and satisfactory control of weeds (mainly Taraxacum officinale, Plantago sp., Rumex sp., Medicago lupulina, Potentilla sp., Polygonum aviculare, Asclepias syriaca, Cirsium vulgare, C. arvense, Sonchus arvensis, Chenopodium album, and Vicia sp.), but did not always control Daucus carota, Tragopogon sp., Lepidium sp., Lactuca sp., Cichorium intybus, Atriplex patula, and Ambrosia artemisiifolia. Neither Atlacide nor Polyborchlorate gave satisfactory control at 0.75 lb/gal.
D.M.L.S. [O.W.]

1730. NITSCHE. Beitrag zur totalen Unkrautvernichtung. [Contribution on total weed control.] [Pap.read at] 4. Dtsche Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung, Hohenheim, 1961, pp.7.
The action of and degree of weed control given by the following herbicides are briefly reviewed: 2,4-D, 2,4,5-T, dichlorprop, mecoprop, fenoprop, amitrole, monuron, diuron, calcium chlorate, sodium chlorate, borates, atrazine, atraton [2-methoxy-4-ethylamino-6-isopropylamino-s-triazine], ametryne, propazine, prometon, simazine and TCA. - J.L.M. [O.W.]

CHEMISTRY, PHYSICS, TOXICOLOGY, RESIDUES AND SOILS

1731. EVANS, T.H. (Summarizer). New herbicides. Res.Rep.E.Sect.Nat.Weed Cttee Canada, 1960, 120-2.
Information contained in this Research Report concerning the performance of the following herbicides is briefly summarized: amiben, amitrole + ammonium thiocyanate, Chlorazine (2-chloro-4,6-bis(diethylamino)-s-triazine, CP 1815 (MCPA + 2,3,6-TBA), CPC 2019 (aromatic oil), Dacthal (dimethyl tetrachloroterephthalate), 2,4-D granular, Dicryl (N-(3,4-dichlorophenyl)methacrylamide), diquat dibromide, fenac, 3,4-dichloropropionanilide, ipazine, 2,6-dichlorobenzonitrile, prometon, propazine, propyl ethyl-n-butyl thiolcarbamate, CDAA, fenoprop, Solan (N-(3-chloro-4-methylphenyl)-2-methylpentanamide), endothal, trietazine, fenuron-TCA, and Zytron (O-(2,4-dichlorophenyl)-O-methylisopropylphosphoroamidothioate). - D.M.L.S. [O.W.]

1732. ELINGS, H. and DAAMS, J. Eigenschappen van het nieuwe herbicide "Casoron 133", 2,6-dichloorbenzonitril. [Properties of the new herbicide 2,6-dichlorobenzonitrile.] Tijdschr.PlZiekt., 1961, 67, (2), 68, [Abstract]
The above herbicide kills germinating seeds and possibly also dormant seeds on contact, occasionally damages growing points, and usually completely arrests root growth. Most seeds are equally susceptible, and selective control of unemerged weeds is possible in established crops at rates of 2,6-dichlorobenzonitrile 4 kg/ha. Bracken is well controlled with an initial application of 15 kg/ha; a lower rate may well be sufficient to control the slight regrowth which occurs during the following year. Applying 2,6-dichlorobenzonitrile to potato clamps at 1 g/1000 kg potatoes effectively controls sprouting. Field Crop Abstr.14:1950. [Md.H.]

1733. * FAILLET, P. Neburon, diuron, monuron, dalapon, leurs proprietes et leurs applications pratiques. [Neburon, diuron, monuron, dalapon, their properties and their application.] Defense des Veg., 1960, 14, (80), 3-8.

1734. IVON WATKINS, LTD. (Ivon Watkins, Ltd., New Plymouth, New Zealand). Vorox SDA. Tech.Bull.Ivon Watkins, Ltd., [n.d.], T-243, pp.4.
Vorox SDA is a mixture of simazine, dalapon and amitrole and is described as a medium-cost material for total vegetation control, to be used at a rate of 40 #, though rates down to 20 # are effective in many cases. The material will give control for some months of most grass and broad-leaved weeds, though certain grasses such as Festuca arundinacea, Cynodon dactylon, Paspalum dilatatum and Agropyron repens may require repeated spot treatment. - P.J.B. [O.W.]

1735. BAZILEVSKAYA, N.A., BRAGINA, K.K., GRINEV, A.N. and TERENTEV, A.P. New plant growth regulators. Vestik Moskov.Univ., 1960, Ser.6,15,(3),33-46.
Several carboxy derivatives of benzofuran and and indole (listed) were prepared and found effective as plant growth stimulators. From Chem. Abstr.55:1998. - P.J.B.

1736. MIKULSKI, J. and ECKSTEIN, Z. (Inst.Syntezy Org.,P.A.N.,Warsaw,Poland). Synthetic herbicides. Preparation of 2,4-dichloro- and 2,4,5-trichlorophenoxyacetic acid labeled with Cl^{36}. Bull.acad polon sci.,Ser Sci.Chim.,geol.et geograph, 1959, 7,285-8, (G.).
Phenoxyacetic acid (0.57 g) was heated to 40°C with 4.5 ml AcOH, 0.7 ml concentrated HCl was added and the mixture cooled to 5°. HCl^{36} gas was introduced, the temperature increased to 56°C and 0.28 g $NaClO_3$ in 2 ml water was introduced dropwise. The mixture was cooled, the precipitate filtered off and crystallized from aqueous ethanol to give 2,4-D in 86.2% yield, with an activity 58.3% of that of HCl^{36}. A similar synthesis with 45 g 2,5-dichlorophenoxyacetic acid, 3 ml AcOH at 50°C, 0.45 ml HCl, 3°C, and 0.07 g $NaClO_3$ gave 2,4,5-T with an activity 62.5% of that of HCl^{36}. From Chem.Abstr.54:20940. P.J.B.

1737. UCHIDA, T. (Sankyo Res.Lab.,Tokyo, Japan). Analysis of agricultural chemicals by using nonaqueous titration. 1. Herbicides of 2,4-D series. Takamine kenkyusho Nempo, 1958, 10,276-82.
When 0.1 N lithium methoxide in C_6H_6-MeOH was used as titrant, suitable solvents were C_6H_6-MeOH (1:1), $CHCl_3$-iso-PrOH (2:1) and $CHCl_2$-dimethylformamide (3:1) and the colour change was very sharp, especially in the case of $CHCl_3$-dimethylformamide. Under these conditions, 2,4-D, MCPA, MCPB, 2,4,5-T and fenoprop were detected with good reproducibility. $CHCl_3$ was satisfactory as a solvent for complete extraction. Titration procedure is described in detail. From Chem.Abstr. 55:1945. - P.J.B.

1738. IVON WATKINS, LTD. (Ivon Watkins, Ltd.,New Plymouth,New Zealand). Compatibility of trace elements and D.D.T. emulsion. with Weedone and Weedar Brand products. Tech. Bull.Ivon Watkins,Ltd., [n.d.], T-241,pp.2.
Brief observations, based on the results of limited laboratory tests, are given on the compatibility of different commercial formulations of 2,4-D, MCPA, MCPB, 2,4-DB with boron, magnesium, molybdenum, cobalt, manganese, copper, iodine and DDT emulsion. P.J.B. [O.W.]

1739. JOHANSEN, C. Bee poisoning. A hazard of applying agricultural chemicals. Circ.Washington Agric.Exp.Sta., 1961, 356, pp.7, tabs.1.
Endothalis highly toxic to bees, amitrole, atrazine and simazine are low to moderate in toxicity, but present some hazard because treated flowers remain open. 2,4-D and related compounds are not hazardous, except when formulated as the alkanolamine salt or isopropyl esters. - M.G.G. [54(79,7)]

1740. LOMONOVA, T.V. Toxicological properties of isopropyl phenylcarbamate and isopropyl 3-chlorophenyl carbamate. Gigiena,Toksikol i Klin.Novykh Insektofungitsidor,Trudy 1-oi (Pervoi) Vzesoyuz.Nauch. Konf.,Kiev, 1957, 315-20.
Propham and chlorpropham administered as single doses to rats and rabbits via the alimentary canal were not highly toxic and acute poisoning occurred only when the dosage was increased to 2-3 g/kg. Subcutaneous administration was relatively more toxic. The principal characteristic of poisoning by these substances was their effect on the blood in causing degenerative changes in the red and white corpuscles, methaemoglobinaemia and other effects. No toxic effect was noted after single exposures to their vapours. From Chem.Abstr.55:2912. P.J.B.

APPLICATION AND MACHINERY

1741. WINNER, C. (Inst.Zuckerrübenforschung, Göttingen, Germany). Die Bandspritzung von Herbiziden in Zuckerrüben. [The band-spraying of herbicides in sugar beet.] BASF Mitt.für den PflSch., 1961, (32),pp.8. figs.8.
Features of band-sprayer designs are reviewed and illustrated. Spray nozzles adjusted to give a spray angle of at least 60° should be mounted approximately 15 cm behind the seed drill and 10-15 cm above ground level to reduce spray drift, and should deliver not more than 0.8 l per minute at a pressure of 2 atm. to a band 15-18 cm wide. Distribution of spray may be estimated by placing a sloping corrugated iron sheet under each spray nozzle and allowing the spray fluid to drain into

measuring cylinders. A formula for calculating the spray volume required for unit area band-sprayed is described. - J.L.M. [O.W.]

1742. WINNER, C. (Inst.Zuckerrübenforschung,Göttingen,Germany). Technische Fragen zur Bandspritzung von Herbiziden im Zuckerrübenbau. [Technical questions on the band-spraying of herbicides in sugar beet.] [Pap.read at] 4. Dtsche Arbeitsbesprechung über Fragen der Unkrautbiologie u.-bekämpfung,Hohenheim, 1961, pp.4.
In a review of band-sprayer design for use in sugar beet, spray nozzle design, maintenance of a constant operating pressure and the adaptability of such a sprayer for the application of liquid fertilizer or insecticides by using adjustable spray nozzles, are among the items discussed. (See also Weed Abstr. 10: 1741). - J.L.M. [O.W.]

1743. UHLIG, S. (Forstbotanisches Inst., Tharandt, E.Germany.) Uber die Wirkungssteigerung von DNOC infolge erhohter Oberflachenaktivitat. [Concerning the increase in effectiveness of DNOC as a result of increased surface activity.] [Pap. read at] 4. Dtsche Arbeitsbesprechung uber Fragen der Unkrautbiologie u.-bekampfung, Hohenheim, 1961, pp.3, tabs.1.
The results are given of 3 trials in which the surface activity of Hedolit (DNOC) and Selinon (DNOC + wetting agent) was investigated. One-year-old Pinus sylvestris seedlings with foliage (a) dry and (b) wetted were dipped in 1% solutions of Hedolit and Selinon [% a.i. not stated], and then dipped in tap water. Herbicide residues were greatest on seedlings dipped with dry foliage and were 0.30 ml and 0.27 ml after treatment with Selinon and Hedolit, respectively. In trials in which 5 ml of solutions of Hedolit and Selinon were applied to pots containing similar weed stands, with or without watering before application, best weed control was obtained with Selinon applied to a dry weed stand. When germinating seeds of Norway spruce (Picea excelsa) were placed in solutions of Hedolit and Selinon for periods between 1 and 24 hr, no difference was found between the 2 herbicides in their effect on the radicle length of the seedlings at 4 days after treatment.
It was concluded that the addition of a wetting agent improved the effectiveness of DNOC only if the foliage of the plants to be treated was dry. - J.L.M. [O.W.]

1744. AKESSON, N.B. and YATES, W.E. (Agric. Engng Dep.,Univ.California,Davis,U.S.A.). Drift and residues of agricultural chemicals and their relations to application equipment techniques, and microweather. Proc. 13th Annu.California Weed Conf., 1961, 83-92, figs.5,tabs.3.
Amounts of insecticidal spray drift on lucerne hay was determined at different distances down-wind from an area of cotton sprayed from the air at a rate of 10 gal/ac in June and October under conditions of 4-6 m.p.h. wind speed, 20-40% relative humidity and a near normal adiabatic lapse rate indicating conditions of low turbulence. Spray containing red dye at 0.2 lb/10 gal or $SrCl_2$ at 0.5 lb/10 gal as tracers, was applied (a) as a fine spray from hollow-cone nozzles directed downwards, (b) as a medium-fine spray applied from jet nozzles directed backwards at 45° with the slipstream and (c) as a fine spray containing 0.1 lb/10 gal of Fluoral 7GA, as a tracer applied from a jet nozzle directed downwards. Samples taken included lucerne replicates from each station, $SrCl_2$ from the ground and air on filter paper and analysed in a flame photometer, 7GA tracer on cellulose acetate sheets, and siliconed glass slides for determining drop size. Tables are given of droplet sizes and numbers and of insecticidal residues in the lucerne at different distances down-wind, together with micrometeorological data. M.G.G. [O.W.]

1745. SMITH, J.L. (U.S.Dep.Agric., Washington,D.C.,U.S.A.). Mist blower for controlling undesirable hardwoods. South. Lumberman, 1960, 201,(2513),185-6.
A compact, 230 lb mist blower made by S.F. Potts is described and the advantages of mist blowing over boom spraying for woody weed control are discussed. - D.M.L.S. [66(75.3)]

PHYSIOLOGY, MORPHOLOGY AND ANATOMY

1746. MANOS, G.E. (Biol.Dep.,Fordham Univ.,New York,U.S.A.). The effects of growth substances on attached and detached root tips of Pisum sativum L. Physiol.Plant., 1961, 14,(4),697-711, figs.4,tabs.4,bibl.40.
Roots of Pisum sativum 'Alaska' attached to the shoot, or detached, were treated for 7 days with IAA (1.2×10^{-4} to 1.2×10^{-7}M), kinetin (5×10^{-4} to 5×10^{-7}M) or gibberellic acid (1×10^{-4} to 1×10^{-7}M). The

difference between the growth of attached and detached roots was studied. Growth rate and elongation in detached roots was inhibited by all concentrations of IAA and kinetin, but in attached roots was inhibited only at the higher concentrations. Gibberellic acid, in both cases, inhibited only at 10^{-4}M. The increase in number of cells present as compared with controls was inhibited in attached roots by gibberellic acid and higher concentrations of kinetin. Detached roots in all experiments and attached roots treated with IAA and low concentrations of kinetin were unaffected. Abnormalities were caused in attached roots by IAA and kinetin at all concentrations and by gibberellic acid at higher concentrations. Detached roots developed normally. - M.G.G. [O.W.]

1747. GORDON, S.A. and PALEG, L.G. (Div. Biol.and Medical Res.,Argonne Nat.Lab., Argonne,Illinois). Formation of auxin from tryptophan through action of polyphenols. Plant Physiol., 1961, 36,(6),838-45, figs.1, tabs.9,bibl.41. [O.W.]

1748. MUMFORD, F.E., SMITH, D.H. and CASTLE, J.E. (Central Res.Dep.,E.I.du Pont de Nemours & Co.,Wilmington,Delaware,U.S.A.). An inhibitor of indoleacetic acid oxidase from pea tips. Plant Physiol., 1961, 36, (6),752-6. [O.W.]

1749. ANDREAE, W.A., ROBINSON, J.R. and van YSSELSTEIN, M.W.H. (Pesticide Res.Inst., Canada Dep.Agric.,London,Ontario). Studies on 3-indoleacetic acid metabolism. VII. Metabolism of radioactive 3-indoleacetic acid by pea roots. Plant Physiol., 1961, 36,(6),783-7.
The apical segment of root tips, 5 mm long, of 2-day-old Alaska pea seedlings were incubated for 24 hours in solutions containing sucrose, calcium ions, potassium phosphate pH 5.3 and samples of radioactive IAA (2 µ moles/20 ml solution) labelled with ^{14}C in one of the following positions: acetic - 1, acetic - 2, or indole - 7a. Homogenised tissue and the culture solution were analysed as follows: (a) metabolites were identified by paper chromatography; (b) the amount of ^{14}C remaining in the samples after 24 hours was determined by measuring the activity of the CO_2 liberated by chromic acid digestion; (c) the presence of an unbroken indole nucleus was determined, using the Ehrlich reagent. Indoleacetyl-aspartic acid, representing 41% of the metabolised IAA, had accumulated in the tissue, but none was found in the culture solution. The remainder of the IAA accumulated in the culture solution as 3 Ehrlich-negative decarboxylation products. The 2 major products were labelled in both the 2 and 7a position, suggesting that the indole ring may break before it is decarboxylated. At a concentration of 2 µ moles of IAA in 20 ml solution, metabolism proceeded in 24 hours as follows: 52% of the IAA remained unchanged in the culture solution, 17% was conjugated with aspartic acid, 19% was decarboxylated and about 6% was degraded without decarboxylation. From authors' summary. - M.G.G. [O.W.]

1750. TRUELSEN, T.A. (Royal Veterinary and Agric.Coll.,Copenhagen,Denmark). Growth-promoting and growth-inhibiting effects of high indole-3-acetic acid concentrations. Physiol.Plant., 1961, 14,(3),520-32, figs.3,tabs.2,bibl.21.
Supra-optimum concentrations of IAA, up to 10^{-3}M, did not inhibit the growth of wheat coleoptiles during the first 3 hours under conditions allowing continuous growth. Treatment with IAA up to 10^{-3}M during the period when elongation of cells was suspended had no inhibiting effect. M.G.G. [O.W.]

1751. FURUYA, M. and GALSTON, A.W. (Bot.Dep.,Univ.Yale,New Haven,Connecticut, U.S.A.). Effect of in vitro pre-incubation with cofactors on the activity of the indoleacetic acid oxidase of peas. Physiol. Plant., 1961, 14,(4),750-66, figs.10, bibl.24. [O.W.]

1752. ELIASSON, L. (Forest Res.Inst., Stockholm 51,Sweden). Responses of pea roots to growth substances. Physiol.Plant., 1961, 14,(4),803-12, figs.3,tabs.2,bibl.27.
A study was made of the responses of the roots of pea seedlings to IAA, 3-indolyl-butyric acid (IBA), 1-naphthylacetic acid (NAA), 2-naphthoxyacetic acid, phenoxy-acetic acid, 2,4-D, MCPA, 4-CPA, 3-chloro-phenoxyacetic acid, 2-chlorophenoxyacetic acid, 2,4,5-T, 2,4,6-trichlorophenoxyacetic acid, phenylacetic acid, 2,3,5-triiodoben-zoic acid. The growth substances were applied either (a) to the hypocotyls of seeds grown on filter paper, (b) to the solution used for moistening the filter paper, or (c) to the culture solution of seedlings grown in test tubes. When the growth substances were applied to the hypocotyl, elongation of the roots was inhibited by smaller quantities of phenoxy auxins and the inhibition was more permanent

than that caused by IAA, NAA and IBA. The effects of the phenoxy auxins were enhanced with time; root growth stopped after 1-2 days, when the growth substances were applied as in (b) or (c). - M.G.G. [O.W.]

1753. SCHRANK, A.R. (Dep.Zool.,Univ. Texas,Austin 12,U.S.A.). Growth and geotropic curvature of Avena coleoptiles in presence of n-1-naphthylphthalamic acid. Plant.Physiol., 1961, 36,(6), 727-32, figs.5,tabs.1,bibl.12.
The effects of naptalam at concentrations ranging from 10^{-7}M to 10^{-4}M-on the growth of 5 mm-sections of Avena sativa coleoptiles, on the elongation of apical segments 15 mm long and on the geotropism and phototropism of apical segments, were measured. At concentrations of 10^{-6}M and less, the elongation and phototropic response of apical segments were unaffected. The phototropic response and elongation of segments in 10^{-5}M solutions, was stimulated. In 10^{-4}M solutions the phototropic response was inhibited, elongation was stimulated for 6 hours, then inhibited. In the presence of exogenous IAA, growth of 5 mm sections in 10^{-5}M and weaker solutions was stimulated. In 10^{-4}M solutions growth was inhibited. Negative geotropic curvature was inhibited by concentrations of 10^{-4}M-10^{-5}M, but slightly stimulated by concentrations of 10^{-6}M-10^{-7}M. It was concluded that naptalam does not function as a typical auxin. - M.G.G. [O.W.]

1754. NORRIS, Jr., W.E. and FOULDS, E.L. (Biol.Dep.,Southwest Texas State Coll., San Marcos,U.S.A.). Effect of gibberellic acid and 3-indoleacetic acid on respiration of onion roots and seedlings. Physiol. Plant., 1961, 14,(3),453-9, figs.1,tabs.3, bibl.19.
Respiration was unaffected by gibberellic acid at concentrations from 1-200 p.p.m. and inhibited by IAA from concentrations of 10-100 p.p.m. - M.G.G. [O.W.]

1755. KHUBITIYA, R.A. (Inst.Plant Protect.,Tbilisi,Russia). Effect of 2,4-D on processes of oxidative phosphorylation. Agrobiologiya, 1959, (1),139-41.
A suspension of mitrochondria obtained from the leaves of young pea plants was incubated in the presence of succinate, adenylic acid (as a P acceptor), 2,4-D and diphosphopyridine nucleotide (DPN) in various combinations. Respiration was not greatly affected by adding 2,4-D to the mixture. Oxidative phosphorylation was completely blocked in the presence of either 10^{-3}M 2,4-D or 10^{-4}M DPN. It was considerably decreased in the presence of 10^{-4}M 2,4-D. Chem.Abstr.55:2819.

1756. PILET, P. (Plant Physiol.Dep.,Univ. Lausanne,Switzerland). Kinetics of the auxin catabolism. Physiol.Plant., 1961, 14,(4), 787-802, figs.8,tabs.4,bibl.63.
The biokinetics of IAA destruction in root tips of Lens culinaris seedlings were studied. M.G.G. [O.W.]

1757. * GUNNING, B.E.S. Some studies on plant growth substances. M.Sc.Thesis,Queen's Univ.,Belfast.

1758. SHAW, W.C. (U.S.Dep.Agric.,Beltsville, Maryland,U.S.A.). Some biochemical aspects of herbicide action and selectivity. Pap. Agric.Sci., 10th Pacif.Congr., 1961, pp.4, [Abstract].
A general discussion. - D.M.L.S. [118(75.2)]

1759. * MONTSERRAT, U.T. Estudio comparativo de la accion de los acidos 2,4-diclorofenoxiacetico y 2,4,5-triclorofenoxiacetico sobre el crecimiento de las raices de Cynara cardunculus L. [Comparison of the action of 2,4-D and 2,4,5-T on the growth of Cynara cardunculus, L. roots.] Spain.Inst.de Biol. Apl.P., 1958, 28,105-14, (Span.e.).

1760. VOROB'EV, F.K. In regard to selective inhibition by 2,4-D of protein synthesis in plants. Moskov.Ordena Lenina Sel'skokhoz. Akad.im K.A.Timiriazeva.Dok., 1959, 47,117-23.
Field crops.

1761. HERRETT, R.A. and LINCK, A.J. (Dep. Bot.Inst.Agric.,Univ.Minnesota,St.Paul 1, U.S.A.). The metabolism of 3-amino-1,2,4-triazole by Canada thistle and Field bindweed and the possible relation to its herbidal action. Physiol.Plant., 1961, 14,(4), 767-76, tabs.4,bibl.14.
Extracts from intact or excised amitrole-treated leaves of Cirsium arvense and Convolvulus arvensis, contained two unknown metabolites, I and II. Amitrole could be detected in Cirsium leaves, 20 days after treatment and no movement from the leaves occurred within 24 hours, possibly until amitrole was converted to unknown I. Catalase activity was reduced 10 days after treatment. No amitrole could be detected in Convolvulus leaves 90 hours after treatment. Cirsium

leaves containing a high percentage of reducing sugars (probably as a result of keeping the petioles at a low temperature) were more severely damaged than the controls. The enzyme system acting on amitrole appeared to be sensitive to temperature and also to NaF. Unknown II, extracted from Convolvulus, had no effect on Cirsium and was stable to acid hydrolysis. Its production was inhibited in the presence of glucose. Possible paths of biosynthesis of unknowns I and II and the equilibria between them and amitrole are postulated. - M.G.G. [O.W.]

1762. FREDRICK, J.F. (Dodge Chem.Co., Res.Lab.,New York,U.S.A.). Biological phosphorylation of 3-amino-1,2,4-triazolyl-glucoside in Cryptococcus neoformans. Physiol.Plant., 1961, 14,(4),734-40, figs.5, bibl.16.
The metabolic fate of amitrole-glucoside, formed by the reaction of amitrole with glucose-1-phosphate was studied in the pink yeast, Cryptococcus neoformans var. innocuous. Amitrole-glucoside was phosphorylated slowly by hexokinase at the C-6 position of the glucose residue. As no free amitrole was detected, it was concluded that the phosphorylated compound was not further broken down by β-glucosidase in this variety of yeast. - M.G.G. [O.W.]

1763. KATTERMAN, F.R.H. and HALL, W.C. (Texas A. and M.Coll.,College Station,U.S.A.). Physiological effects and degradation of s,s,s-tributylphosphorotrithioate by cotton leaves as shown by the P^{32} and S^{35} labeled compounds. Plant Physiol., 1961, 36,(6), 816-19, figs.2,tabs.2,bibl.14.
The effect of s,s,s-tributylphosphorotrithioate (DEF) on the respiration and on -SH (thiol) group of water-soluble proteins in cotton leaves was studied. DEF was applied to plants at 3 # in 35 gal water and samples from leaves taken after 4, 12, 24, 48 and 72 hours. Respiration rates, as determined in Warburg flasks, were significantly stimulated before abscission. The thiol content was determined by Ishii's monometric method and the water-soluble protein content by the method of Loomes and Schull. Young and mature leaves were found to have the same thiol content as senescent and naturally-abscising leaves. The mode and rate of degradation was determined using DEF containing ^{32}P or ^{35}S. The degradation products were found to consist of 3 water-soluble S compounds and 3 water-soluble P compounds. The relative distribution of P and S in these compounds was determined by paper chromatography and showed a definite sequence of formation. The approximate degradation rate for DEF was 1.2% of the total amount in an hour. - M.G.G. [O.W.]

1764. SHIMADA, T. Effects of low concentrations of MH on the reproductive phase in a short-day plant, Xanthium japonicum. 2. Agric.Bull.Saga Univ., 1959, (8),35-72, illus,(Jap.e.), bibl.56.
Plants received 1 application of MH 130 p.p.m. at periods ranging from 4 days before to 5 days after the start of short-day treatment. Effects included inhibition of internode elongation, the growth of axillary buds, a decrease in the number of male inflorescences, an increase in the number of nodes with female inflorescences per node and the formation of malformed male and female inflorescences. The effects were most marked when sprays were applied after the start of short-day treatment. From Hort.Abstr.31:3717. - J.W.F.

1765. SCHNEIDER, G. (Botanisches Inst. der Ernst-Moritz-Arndt-Univ.Greifswald, Germany). Orcylalanin, seine Verteilung und physiologische Bedeutung in Agrostemma githago L. [Orcylalanine its distribution and physiological importance in Agrostemma githago L.] Physiol.Plant., 1961, 14,(3), 638-45, figs.1,tabs.3,bibl.3.
The distribution of Orcylalanine in Agrostemma githago plants during its development, and its importance in the nitrogen metabolism of the plant, were studied. - M.G.G. [O.W.]

PATENTS

1766. STOTA, Z., LIVAR, M. and HAVALDA, P. Sodium salt of 2,4,5-trichlorophenoxyacetic acid. Czech.Patent 93,491; 15.1.60.
Preparation. From Chem.Abstr.55:3522.

1767. STEVENSON, H.A. and BROOKES, R.F. (Boots Pure Drug Co.,Ltd.). α-Phenoxy-alkanoic acids. British Patent 822,199; 21.10.59.
Preparation of 2,4-D, MCPA, 2,4,5-T, p-chlorophenoxyacetic acid, O-methylphenoxy-acetic acid, 2-bromo-4-chlorophenoxyacetic acid and α-(2,4-dichlorophenoxy)butyric acid. From Chem.Abstr.55:2575.

1768. GORDON, D.A. and CORBETT, J.M. (Dow Chemical Co.). Bis(p-halophenyl) esters of cyclic 1,2-dicarboxylic acids. U.S. Patent 2,942,023; 21.6.60.
The preparation of bis(p-chlorophenyl) 1,2-cyclohexanedicarboxylate and its methyl ester is described. The compounds were used to kill aquatic vegetation. From Chem.Abstr.54:19596.

1769. HAGER, F.M.M.J. (Dominion Rubber Co.,Ltd.). Decolorizing esters of 2,4-D and 2,4,5-T. Canadian Patent 597,254; 3.5.60.
Commercial esters of 2,4-D and 2,4,5-T with Gardner colours of 9-16 are decolorized to 4-8 by treatment with small amounts of chlorine gas. From Chem.Abstr.54:20060.

1770. STEINBRUNN, G. and FISCHER, A. (Badische Anilin.-u.Soda-Fabrik,A.-G.). Phenoxyglycerol diesters and their use as herbicides. British Patent 845,632; 2.1.59.
Compounds with herbicidal properties comprise phenyl glycerol esters. Details are given of the preparation of 1-(2,4-dichlorophenoxy)-2,3-di(αα-dichlorobutyryloxy) propane. From J.Sci.Fd Agric., 1961, 12,(11),ii-217.

1771. TISCHLER, N. (Heyden Newport Chem.Corp.). Trichlorobenzoic acids as herbicides. German Patent,1,046,394; 11.12.58.
A herbicide is described which contains 60-70% (by weight) of 2,3,6-trichlorobenzoic acid, 15-30% of 2,4,5-trichlorobenzoic acid and 10% of other isomers or salts. From Chem.Abstr.55:891.

1772. MUSSELL, D.R. (Dow Chemical Co.). Herbicide for killing wild oats. German Patent 1,034,914; 24.7.58.
The effective substance is 1,2,4,5-tetrachlorobenzene, applied to soil to give a concentration of 8 p.p.m. From Chem.Abstr.55:892.

1773. HOOKER ELECTROCHEMICAL CO. 2,3,5,6-tetrachlorobenzoyl halides and their derivatives. British Patent 833,218; 21.4.60.
Preparation. From Chem.Abstr.54:20062.

1774. SCHAFER, W., EUE, L. and WEGLER, R. (Farbenfabriken Bayer, A.-G.). Herbicides. German Patent 1,039,779; 25.9.58.
Carboxylic anilides of the formula $3,4,5\text{-}X_3C_6H_2NHCOCH_2Me$ are the basis of the weed killer. X stands for H, halogen, alkyl or NO_2 radicals. The propionyl group may be replaced by halogen. From Chem.Abstr. 54:20061.

1775. TOMLINSON, T.E. (ICI, Ltd.). Herbicidal compositions. British Patent 862,847; 15.3.61.
The corrosion of zinc or galvanised iron by diquat dibromide is lessened by adding Calgon and a mercaptan or thiophenol, without loss of herbicidal activity. From Chem. Abstr. 55:15820. -

1776. SIMS, J.G. and MOYLE, C.L. (Dow Chemical Co.). 2-Nitro-3,4,6-trichlorophenylbenzenesulfonates. U.S. Patent 2,949,482; 16.8.60.
The title compounds are useful as herbicides. From Chem. Abstr.55:1532.

1777. J.R. GEIGY, A.-G. Plant-growth regulators comprising heterocyclic nitrogen compounds. British Patent 822,069; 21.10.59.
Diazine and benzodiazine compounds which are substituted by 1 or more halogen atoms, mono- or dialkylamino, mono- or dialkenylamino, alkoxy, alkenyloxy, alkylthio or alkenylthio, polymethyleneimino, or morpholino groups and which may be further substituted by an amino group or 1 or more alkyl groups with 4 or more C atoms are used to inhibit plant growth and as defoliants. From Chem. Abstr.55:2005.

1778. GODREY, K.L. and D'AMICO, J.J. (Monsanto Chem.Co.). Polyhalobenzylthiobenzothiazoles and benzoxazoles for use as herbicides. U.S. Patent 2,921,079; 12.1.60.
Most of the compounds listed had phytotoxicity ranging from slight to severe for broad-leaf plants when applied as sprays or used pre-em. Several showed toxicity to Setaria sp., Secale sp., Bromus sp., Echinochloa crusgalli and Digitaria sp. From Chem.Abstr.55:569.

1779. LEVY, R. and MENORET, Y. [Etat Francaise] Herbicides. French Patent 1,193,374; 2.11.59.
(1,2,4-Triazolyl) urea, 1,1-dimethyl-3-(1,2,4-triazolyl)urea, 1-phenyl-3-(1,2,4-triazolyl)thiourea and 1-allyl-3-(1,2,4-triazolyl)thiourea are described as foliar-

and root-acting herbicides with a long residual effect in soil. From Chem.Abstr. 55:892.

1780. SEARLE, N.E. (E.I. du Pont de Nemours & Co.). Herbicides. German Patent 1,039,304; 18.9.58.
The active substances are tetrasubstituted ureas, examples of which are: 1-(p-chlorophenyl)-1,3,3-trimethylurea, 1-(2,4-dichlorophenyl)-1,3,3-trimethylurea, 1-(p-iodophenyl)-1,3,3-trimethylurea and 1-(3,4-dichlorophenyl)-1-ethyl-3,3-dimethylurea. From Chem.Abstr. 54:20061.

1781. D'AMICO, J.J. (Monsanto Chemical Co.). S-allyl thiolcarbamate as an herbicide. U.S. Patent 2,941,880; 21.6.60.
The title compound is an effective pre-em. herbicide for use in maize and sugar beet. At 25 #, it gave complete kill of wild oats, buckwheat and radish, severely damaged ryegrass, red clover, cotton and Setaria spp. but did not affect maize or sugar beet. From Chem.Abstr.54:20061.

1782. GOODHUE, L.D. (Phillips Petroleum Co.). S-alkylsulfenyl dialkyldithiocarbamates as herbicides. U.S. Patent 2,941,879; 21.6.60.
The title compounds are effective selective herbicides for controlling grass, especially Cynodon dactylon, in commercial crops. Especially effective were $R_2NC(:S)(S)_xR'$, in which R, x and R' are Pr, 3 and tert-Bu, Et, 3 and tert-Bu, and cyclopentyl, 3 and tert-Bu. S-butyl diisopropyl dithiocarbamate was highly toxic to a variety of crop plants and moderately toxic to C. dactylon. Chem.Abstr. 54:20061.

1783. WINDEL, H., FISCHER, A. and STUMMEYER, H. (Badische Anilin-u.Soda Fabrik, A.-G.). Herbicides. German Patent 1,034,912; 24.7.58.
The herbicides contain, as active constituents, arylcarbamic acid esters of the formula $PhNHCO_2CHMeC{:}CH$ or $PhNHCO_2CHMeCH{:}CH_2$ optionally mixed with compounds of the formula $Cl_nC_6H_mNHCON(R)CH_2COOZ$, or $Cl_nC_6H_m\overline{N}.\text{-}CO.N(R).CH_2.CO$, in which n is 0, 1 or 2, m is 5, 4 or 3, Z is H, alkyl, NH_4, substituted ammonium or a metal, and R is a lower alkyl group, preferably Me. Chem.Abstr.54:20060.

1784. ECKSTEIN, Z., EJMOCKI, Z. and GWIAZDECKA, I. O mozliwosciach wykorzystania mieszaniny trojchlorobenzenow do syntezy chemicznych srodkow ochrony roslin i innych pestycydow. [The possibility of utilization of a mixture of trichlorobenzenes in the synthesis of chemical plant protection agents and other pesticides.] Przemysl Chemiczny, 1960, (10), 616-21, tabs.3.
The possibility is discussed of utilizing isomeric trichlorobenzenes prepared in the process of alkaline removal of HCl from inactive derivatives of hexachlorocyclohexane. The best method appeared to be chlorination, leading to the preparation of tetra- and hexachlorobenzene. Both products could be utilized further in the synthesis of such materials as 2,4,5-trichlorophenol, PCP, pentachlorothiophenol, 2,4,5-T, etc. - From Polish Tech.Abstr., 1961, 43,(3),7085.

1785. BRIAN, R.C., DRIVER, G.W., HOMER, R.F. and JONES, R.L. (ICI Ltd.). Herbicidal compositions containing 4,4' bipyridine quaternary ammonium compounds. British Patent 813,531; 21.5.59.
Aqueous herbicidal compositions contain, as active ingredient, at least one 4,4' bipyridinium salt containing the same or different alkyl radicals of 4 or more C atoms or carboxymethyl radicals or an anion, in the presence of a wetting agent and (or) a humectant. Especially useful compounds are: 4,4'bipyridine dimethiodide, dimethobromide, dimethochloride, dimethosulphate, diethiodide and dicarboxymethochloride. From Chem.Abstr.55:2991.

1786. HERTEL, O., PASEDACH, H., FISCHER, A., PFAFF, C. and STUMMEYER, H. (Badische Anilin-u.Soda-Fabrik,A.-G.). Herbicides. German Patent 1,032,969; 26.6.58.
The compounds consist of monohydroxy alcohols with 7-14 C atoms and a double or triple bond between two C atoms, or their esters, ethers or acetals. Examples are: 1-ethynyl-1-cyclohexanol, 1-ethynyl-1-cyclooctanol, 1-ethynyl-1-cycloheptanol, 2-methyl-5-hexyn-4-ol, 2,4-dimethyl-5-hexyne-4-ol, 2,6-dimethyl-7-octyn-6-ol, 2,4-dimethyl-2-octyn-7-yne-6-ol, 1-thienyl-2-methyl-2-propyn-1-ol and 1-phenyl-1-methyl-2-propyn-1-ol. From Chem.Abstr.54:21625.

1787. DAVIS, E.A. (Dow Chemical Co.). Compositions for killing soil organisms, seeds and seedlings. U.S. Patent 2,957,761; 25.10.60.
Either 4-chloro-2-butyn-1-ol or 4-bromo-2-butyn-1-ol at concentrations of 4 p.p.m. or more in the growth medium eliminates invertebrate soil organisms, germinative seeds and seedlings. From Chem.Abstr. 55:2989.

1788. HEYWOOD, B.J. and LEEDS, W.G. (May & Baker, Ltd.). Herbicides. German Patent 1,027,008; 27.3.58.
Substances of the general formula AOXOR, in which A is aryl, X is a saturated or unsaturated hydrocarbon chain or 4 C atoms, and R is an H atom or a residue of an organic or inorganic acid, especially 4-(2-methyl-4-chlorophenoxy)butanol, 4-(2,4-dichlorophenoxy)butanol, 4-(2,4,5-trichlorophenoxy)butanol, or their acetates, used as weed killers. Chem. Abstr.54:20060.

1789. GEISEL, W. (Badische Anilin-u. Soda-Fabrik, A.-G.). Substituted urea compounds. German Patent 1,064,051; 27.8.59.
Preparation. Chem.Abstr.55:13373.

1790. RAKOFF, H. (Velsicol Chemical Corp.). Pentachlorocyclopentadiene mono-2-ethylhexyl ether. U.S. Patent 2,946,674; 26.7.60.
Preparation. From Chem.Abstr.55:3473.

1791. HOOKER CHEMICAL CORP. Selective herbicides and compositions therefrom British Patent 860,310; 1.2.61.
Preparation of fenac. From Chem.Abstr. 55:12755.

1792. BROWN, J.P. (Monsanto Chemicals, Ltd.). [Herbicides.] British Patent 844,329; 26.2.58.
2-Allylphenols with 1 or 2 halogen and 1 or 2 alkyl groups in the benzene nucleus (the p-position being unsubstituted if only 5 substituents are present) are active against fungi (including Botrytis cinerea) and useful as herbicides. Compounds prepared include 2-allyl-4-chloro- and -4,6-dichloro-3,5-dimethylphenol. From J.Sci.Fd Agric., 1961, 12, (11), ii-217.

1793. WHEELER, D.D. and YOUNG, D.C. (Dow Chemical Co.). 3-Substituted phthalides. U.S. Patent 2,945,865; 19.7.60.
These compounds are useful as herbicides. Their preparation is described. From Chem.Abstr.55:2577.

1794. PHILIPS GLOEILAMPENFABRIKEN, N.V. Plant growth regulators. British Patent 862,863; 15.3.61.
Certain derivatives of benzonitrile, e.g. 2,6-dichlorobenzonitrile, 2-chloro-6-methylbenzonitrile and 2,4,6-trichlorobenzonitrile are effective as herbicides against Avena fatua, Avena sativa and Agropyron repens. Other similar derivatives, e.g. 2,4,5-trichlorobenzonitrile at 2.8-48 kg/ha stimulate plant growth. From Chem.Abstr. 55:13756.

1795. BARKER, C.H. (Fisons Pest Control, Ltd.). Agricultural chemical compositions containing a copolymer of vinylpyrrolidinone. British Patent 831,344; 30.3.60.
To prevent precipitation when agricultural chemicals are diluted with hard water, 0.01-2% by weight of a polymer or copolymer of vinylpyrrolidinone is added. The invention relates especially to water-soluble salts of herbicidal ring-substituted aryloxyaliphatic acids. From Chem.Abstr.54:20056.

1796. LUCKENBAUGH, R.W. (E.I. du Pont de Nemours & Co.). Controlling weeds with aromatic barbiturates. U.S. Patent 2,959,475; 8.11.60.
The title compounds at 8 # give pre-em. control of broad-leaf weeds and Digitaria spp. in mature grass and at 70-100 # control grassy and broad-leaf weeds. Representative compounds are: Na.1-(3,4-dichlorophenyl)-3-methylbarbiturate, Na 5-chloro-1-ethyl-3-phenylbarbiturate, 5-bromo-1-methyl-3-phenyl-5-propylbarbiturate, 5-butyl-5-chloro-1-ethyl-3-(2,4,5-trichlorophenyl) barbituric acid. From Chem.Abstr.55:5855.

1797. SCHERER, O., STAHLER, G. and GASSNER, G. (Farbwerke Hoechst, A.-G.). Herbicides. German Patent 1,061,123; 9.7.59.
The compounds contain vinyl tin compounds of the empirical formula $(CH_2{:}CH)_nSnX_{(4-n)}$, in which X is halogen, OH, the residue of an organic acid, a mercaptan, a sulphonamide, a sulphanilide or an imide of an acid. Tetravinyl tin and vinyl tin halides can be prepared from vinyl magnesium halides with tin tetrahalides. Trivinyl tin chloride at 3-5 g/sq.m gives total vegetation control for 8-14 months. From Chem.Abstr.55:6773.

1798. LAMPARSKY, D. and BÖHM, R. Homochromanone derivatives. German Patent 1,037,465; 28.8.58.
γ-Phenoxybutyric acids were treated with P_2O_5-H_3PO_4 to give the title compounds, including 7-chloro-9-methyl homochromanone and the 6,7,9-trichloro, 6,9-dichloro and 7-fluorohomochromanones. From Chem.Abstr. 54:22693.

1799. SIEFKEN, W., BAYER, O. and EUE, L. (Farbenfabriken Bayer, A.-G.). Herbicides. German Patent 1,039,302; 9.9.58.
Suitable substances are hydantoins of the general formula RN.CH_2.C(:O).N(R').C(:O), where R is an alkyl group and R' is a haloalkyl, cycloalkyl, aralkyl or haloaryl group substituted by NO_2 or CF_3 groups. Preparation is described. From Chem.Abstr.54:20060.

1800. GOYETTE, L.E. (Virginia-Carolina Chemical Corp.). Defoliating agents for plants. U.S. Pat. 2,955,803; 11.10.60.
The preparation is described of a trialkyl trithiophosphite, useful as a defoliant for crops with an annual leaf fall. From Chem. Abstr.55:2991.

1801. BRUGMANN, W.H., YOWELL, H.L. and MIKESKA, L.A. (Esso Research and Engineering Co.). Defoliation of plants with oxidized white oil emulsions. U.S. Patent 2,945,753; 19.1.60.
The preparation of (a) oxidized Marcol JX and (b) oxidized XCT white oil and the butyl ester and "natural" esters of oxidized XCT is described. Applications of (a) and the butyl and "natural" esters of (b) at 20 gal/ac as 25% emulsions containing 75-87% WS-1449, 3% Mulsor 3-CW and 2% Acto 630 gave 65, 70-75 and 70-75% plant defoliation, respectively, in 10-14 days. From Chem.Abstr.54:20059.

1802. APPLER, H. and SPAETH, A. (Badische Anilin-u.Soda-Fabrik,A.-G.). Improving the adhesion of pesticides to plants. German Patent 1,051,564; 26.2.59.
Details are given of the production of oxyethylated resinic acids which contain only a small amount of water-insoluble products. From Chem.Abstr.55:2002.

1803. PRATT, B.C. and WEBSTER, O.W. (E.I. du Pont de Nemours & Co.). 2-Fluorotropones. U.S. Patent 2,894,989; 14.7.59.
The preparation of 2-fluorotropone is described. It is stated to be a useful component of herbicides. From Chem.Abstr. 55:420.

1804. TRUFFAUT, G. and PASTAC, I. (Etablissements et Laboratoires,France). Herbicides. French Patent 1,159,289; 25.6.58.
The selectivity of phenolic and acidic herbicides is increased by lowering the pH with Na_2SO_4 or $Al_2(SO_4)_3$. For example, on treatment of crops with 1000 l/ha of a solution containing 3 kg ammonium 2,4-dinitrocresylate, a large number of crops were damaged. When 9 kg of $Al_2(SO_4)_3.18H_2O$ was added to the solution, very little damage took place. Chem.Abstr.54:20061.

1805. WARREN, J.C.R. (Dominion Rubber Co.,Ltd.). Herbicidal composition for use with hard water. Canadian Patent 594,214; 15.3.60.
The addition of tribasic amine citrates to concentrated amine salt formulations of 2,4-D or 2,4,5-T prevented the precipitation in hard water. These citrates can most conveniently be incorporated directly into the concentrated formulations simply by mixing the triamine citrate or by mixing an amine and citric acid with the herbicide. Tri-ammonium citrate is also effective, but the organic citrates are preferred. Chem.Abstr.54:20061.

MISCELLANEOUS

1806. ARKANSAS AGRICULTURAL EXTENSION SERVICE. Guide for using chemicals in weed control. Publ.Arkansas Agric.Ext. Serv., 1961, pp.11, tabs.2.
[33(76.7)]

List of common names and abbreviations used for herbicides in Weed Abstracts

An asterisk (*) signifies approval by the British Standards Institution (BSI)
A plus sign (+) signifies approval by the Weed Society of America (WSA)
Where the name approved by the WSA differs from that approved by the BSI, the WSA name is given in brackets after the chemical name.

amiben +	3-amino-2,5-dichlorobenzoic acid
ametryne *	2-methylmercapto-4-ethylamino-6-isopropylamino-1,3,5-triazine
amitrole +	3-amino-1,2,4-triazole
AMS +	ammonium sulphamate
atrazine *+	2-chloro-4-isopropylamino-6-ethylamino-1,3,5-triazine
barban *+	4-chloro-2-butynyl-N-(3-chlorophenyl)carbamate
BiPC	butinol-N-(3-chlorophenyl)carbamate
CDAA +	2-chloro-NN-diallylacetamide
CDEA +	2-chloro-NN-diethylacetamide
CDEC +	2-chloroallyl-NN-diethyldithiocarbamate
chlorpropham *	isopropyl-N-(3-chlorophenyl)carbamate - (CIPC)
4-CPA *+	4-chlorophenoxyacetic acid
4-CPB	4-(4-chlorophenoxy)butyric acid
2,4-D *+	2,4-dichlorophenoxyacetic acid
dalapon *+	2,2-dichloropropionic acid
2,4-DB	4-(2,4-dichlorophenoxy)butyric acid - (4-(2,4-DB))
DCU +	dichloralurea
2,4-DEB +	2,4-dichlorophenoxyethyl benzoate
2,4-DEP +	tris-(2,4-dichlorophenoxyethyl)phosphite
2,4-DES *	2,4-dichlorophenoxyethyl hydrogen sulphate - (sesone)
di-allate *	2,3-dichloroallyl diisopropylthiolcarbamate
dichlone *+	2,3-dichloro-1,4-naphthoquinone
dichlorprop *	2-(2,4-dichlorophenoxy)propionic acid - (2-(2,4-DP))
dinosam *	2-s-amyl-4,6-dinitrophenol - (DNAP)
dinoseb *	2-s-butyl-4,6-dinitrophenol - (DNBP)
diquat *+	1,1'-ethylene-2,2'-bipyridylium-2A
diuron *+	N-(3,4-dichlorophenyl)-N'N'-dimethylurea
DMTT +	3,5-dimethyltetrahydro-1,3,5,2H-thiadiazine-2-thione
DNOC	2-methyl-4,6-dinitrophenol or 3,5-dinitro-o-cresol - (DNC)
endothal *+	3,6-endoxohexahydrophthalic acid
EPTC +	ethyl-NN-dipropylthiolcarbamate
erbon	2-(2,4,5-trichlorophenoxy)ethyl-2'2-dichloropropionate
fenac +	2,3,6-trichlorophenylacetic acid
fenoprop *	2-(2,4,5-trichlorophenoxy)propionic acid - (silvex)
fenuron *+	N-phenyl-N'N'-dimethylurea
ipazine *+	2-chloro-4-diethylamino-6-isopropylamino-1,3,5-triazine
MCPA *+	4-chloro-2-methylphenoxyacetic acid
MCPB *	4-(4-chloro-2-methylphenoxy)butyric acid - (4-(MCPB))
mecoprop *	dl 2-(4-chloro-2-methylphenoxy)propionic acid - (2-(MCPP))
MH +	maleic hydrazide
monuron *+	N-(4-chlorophenyl)-N'N'-dimethylurea
neburon +	N-(3,4-dichlorophenyl)-N'-butyl-N'-methylurea
naptalam *	N-1-naphthylphthalamic acid - (NPA)
OMU	N-cyclooctyl-N'N'-dimethylurea
paraquat *	1,1'-dimethyl-4,4'-bipyridylium-2A
PCP +	pentachlorophenol
prometon *	2-methoxy-4,6-bis(isopropylamino)-1,3,5-triazine
propazine *+	2-chloro-4,6-bis(isopropylamino)-1,3,5-triazine
propham *	isopropyl-N-phenylcarbamate - (IPC)
simeton *	2-methoxy-4,6-bis(ethylamino)-1,3,5-triazine
simazine *+	2-chloro-4,6-bis(ethylamino)-1,3,5-triazine
simetryne *	2-methylmercapto-4,6-bis(ethylamino)-1,3,5-triazine
SMDC +	sodium methyl dithiocarbamate
2,4,5-T *+	2,4,5-trichlorophenoxyacetic acid
2,4,5-TB	4-(2,4,5-trichlorophenoxy)butyric acid - (4-(2,4,5-TB))
2,3,6-TBA +	2,3,6-trichlorobenzoic acid
TCA +	trichloroacetic acid
2,4,5-TES +	sodium 2,4,5-trichlorophenoxyethyl sulphate
trietazine *+	2-chloro-4-diethylamino-6-ethylamino-1,3,5-triazine

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